

1

## 1 Choose the correct answer from the given ones :

If the mode of the values : 3 , 7 , 4 , a + 3 is 7 , then a = .....

(a) 7 (b) 4 (c) 3 (d) 2

2

The rational number half way between  $\frac{1}{4}$  and  $\frac{3}{4}$  is .....(a)  $\frac{3}{8}$  (b)  $\frac{5}{8}$  (c)  $\frac{5}{12}$  (d)  $\frac{1}{2}$ 

3

The median of the values : 9 , 8 , 7 , 12 , 5 is .....

(a) 7 (b) 8 (c) 9 (d) 12

4

If the mode of the values 4 , 11 , 8 , 2 x is 4 , then x = .....

(a) 2 (b) 4 (c) 6 (d) 8

5

If the rational number  $\frac{x-3}{x-5} = 0$  , then x = .....(a) 3 (b) 5 (c) -3 (d) -5

6

The remainder of subtracting x from -2 x is .....

(a) x (b) -x (c) 3 x (d) -3 x

7

The expression  $3x^2y - 6x$  its degree is .....(a) 1 (b) 2 (c) 3 (d) 4

8

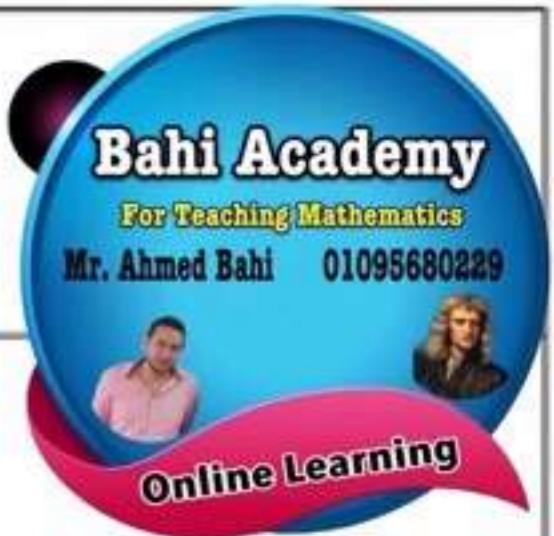
If the order of the median of some values is the fourth , then the number of these values is .....

(a) 2 (b) 3 (c) 5 (d) 7

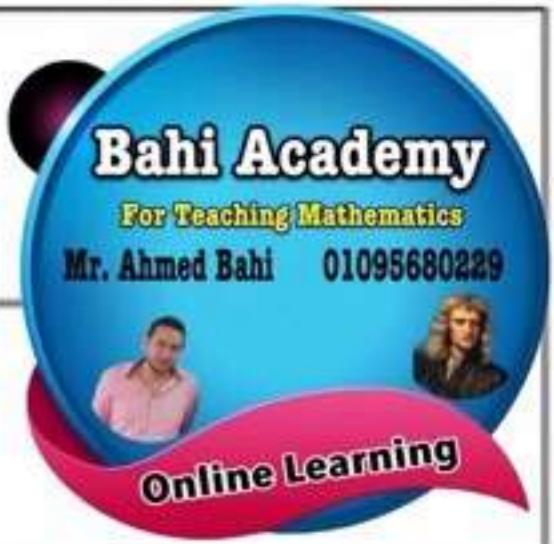
9

 $(x^2 + x) \div x = \dots$  (where  $x \neq 0$ )(a) 0 (b) x (c)  $2x + 1$  (d)  $x + 1$ 

10	If $\frac{3}{x+5} \in \mathbb{Q}$ , then $x \neq \dots$			
	(a) zero	(b) -3	(c) -5	(d) 5
11	If $\frac{x}{y} = 1$ , then $3x - 3y = \dots$			
	(a) zero	(b) 1	(c) 3	(d) 6
12	If $(x-3)(x+3) = x^2 + k$ , then $k = \dots$			
	(a) -6	(b) 6	(c) 9	(d) -9
13	The highest common factor of the two terms of the expression: $21x^2 + 14x^3$ is $\dots$			
	(a) $3x$	(b) $7x$	(c) $7x^2$	(d) $3x^2$
14	The arithmetic mean of the numbers: 3, 4, 6, 7 is $\dots$			
	(a) 3	(b) 4	(c) 5	(d) 8
15	If $\frac{a}{b} = \frac{1}{2}$ , then $2a - b = \dots$			
	(a) 1	(b) 0	(c) 3	(d) -1
16	The algebraic term: $-4xy^2$ is of $\dots$ degree.			
	(a) second	(b) third	(c) fourth	(d) fifth
17	The mean of the values 2, 8, 6, 4 is $\dots$			
	(a) 3	(b) 4	(c) 5	(d) 6
18	If the order of the median of a set of values is the fifth, then the number of these values is $\dots$			
	(a) 6	(b) 10	(c) 11	(d) 9
19	The necessary condition to make $\frac{5}{x-3}$ a rational number is $\dots$			
	(a) $x \neq 3$	(b) $x = 4$	(c) $x = 5$	(d) $x = 3$



20	The mode for the values 3, 5, 3, 4, 3 is .....			
	(a) 3	(b) 4	(c) 5	(d) 12
21	The median of the values: 7, 3, 4, 5, 2 is .....			
	(a) 3	(b) 4	(c) 5	(d) 7
22	The decreases of $3X$ than $4X$ is .....			
	(a) 1	(b) $X$	(c) $-1$	(d) $-X$
23	If $(X-5)(X+5) = X^2 - m$ , then $m =$ .....			
	(a) -25	(b) zero	(c) 10	(d) 25
24	$2a^3b \times 5a^2b^2 =$ .....			
	(a) $10a^5b^3$	(b) $10a^6b^3$	(c) $10a^5b^2$	(d) $7a^5b^3$
25	The order of the median of 5, 2, 3, 9, 7, 1, 6 is .....			
	(a) 9	(b) 5	(c) 4	(d) 2
26	The algebraic term $2X^3y^2$ its degree is .....			
	(a) the second.	(b) the third.	(c) the fourth.	(d) the fifth.
27	$\frac{5}{12} =$ .....			
	(a) 0.42	(b) 0.416	(c) $0.41\dot{6}$	(d) $0.4\dot{5}$
28	The coefficient of the algebraic term $3Xy^2z^4$ is .....			
	(a) 2	(b) 3	(c) 6	(d) 7
29	If the degree of the algebraic term $2a^3b^n$ is ninth, then $n =$ .....			
	(a) 8	(b) 6	(c) 2	(d) 9
30	$-2X$ exceeds $X$ by .....			
	(a) $3X$	(b) $-3X$	(c) $3X^2$	(d) $2X$



31	The increase of 7 a than 3 a = .....			
	(a) -4 a	(b) 4 a	(c) 10 a	(d) -10 a
32	The additive inverse of the number $ - \frac{2}{5} $ is .....			
	(a) $\frac{5}{2}$	(b) $\frac{2}{5}$	(c) $-\frac{2}{5}$	(d) $-\frac{5}{2}$
33	$-6x^3y^2 \div 3x^2y = \dots$ , where $x, y \neq 0$			
	(a) $-2x^2y$	(b) $2xy$	(c) $-2xy$	(d) $-2x^2y^2$
34	$\dots \div 6a^2 = -4a^4$ , where $a \neq 0$			
	(a) $24a^6$	(b) $24a^2$	(c) $4a^2$	(d) $-24a^6$
35	$2x \times 3x = \dots$			
	(a) $6x$	(b) $5x$	(c) $6x^2$	(d) $5x^2$
36	$(4x-3)(x-4) = \dots$			
	(a) $4x^2 - 19x - 12$	(b) $4x^2 - 7$	(c) $4x^2 - 12$	(d) $4x^2 - 19x + 12$
37	The middle term in the expansion of $(2x-5y)^2$ is .....			
	(a) $-10x^2y^2$	(b) $10x^2y^2$	(c) $20xy$	(d) $-20xy$
38	The multiplicative inverse of the number 0.5 is .....			
	(a) 1	(b) 5	(c) -2	(d) 2
39	The middle term in the expression $(x-5)^2 = \dots$			
	(a) $5x$	(b) $10x$	(c) $-5x$	(d) $-10x$



40 If  $(X+1)^2 = X^2 + kX + 1$ , then  $k = \dots$   
 (a) 1 (b) 2 (c) 3 (d) 4

41 The additive inverse of the number  $\frac{3}{7}$  is  $\dots$   
 (a)  $\frac{7}{3}$  (b)  $-\frac{7}{3}$  (c)  $-\frac{3}{7}$  (d) 7

42 The degree of the algebraic term  $3X^2y^2z$  is  $\dots$   
 (a) first. (b) third. (c) fourth. (d) fifth.

43 If the arithmetic mean of marks of five students is 30, then the sum of their marks is  $\dots$   
 (a) 6 (b) 30 (c) 35 (d) 150

44 The order of the median of the values: 6, 2, 5, 4, 1 is  $\dots$   
 (a) 1 (b) 2 (c) 3 (d) 4

45 If the term  $3X^2y^{m+1}$  is from the 6<sup>th</sup> degree, then  $m = \dots$

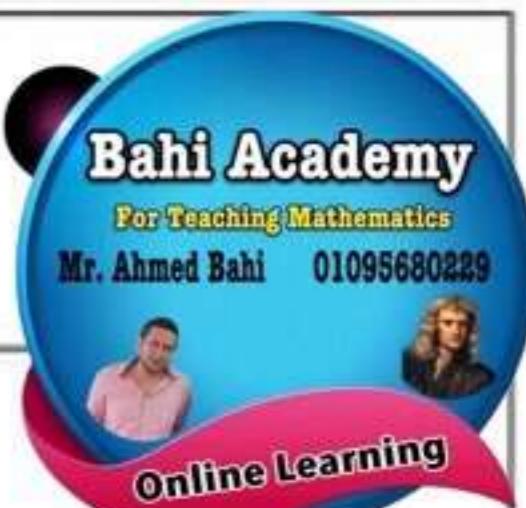
46  $(X-4)(X+4) = X^2 - \dots$

47  $(3X-3)(2X+4) = 6X^2 + \dots - 12$

48 The multiplicative inverse of  $3\frac{1}{2}$  is  $\dots$

49  $(X-5)(X+5) = \dots$

50  $X^2 + 3yX - X^2 + 2Xy = \dots$



100

51 Find three rational numbers included between :  $\frac{1}{3}$  and  $\frac{1}{2}$

52 Simplify :  $(2a - 3)(2a + 3) + 7$   
, then find the numerical value of the result when  $a = -1$

53 Use the property of distribution to find the result of :  $\frac{3}{7} \times 2 + \frac{3}{7} \times 6 - \frac{3}{7}$

54 Subtract :  $-a^2 - 5ab + 4b^2$  from  $3a^2 - 2ab - 2b^2$

55 Find the quotient of :  $20a^3b^2 + 15a^2b^3 + 10ab$  by  $5ab$  where  $ab \neq 0$

56 Divide :  $(x^2 + 5x + 6)$  by  $(x + 2)$  (where :  $x \neq -2$ )

57 | Simplify :  $(x + 2)^2 + (x - 2)(x + 2)$

58 \* Add the two expressions :  $2x - 7y + 2z$  and  $5z + 6y - 2x$

59 Divide :  $6x^2 + 13xy + 6y^2$  by  $2x + 3y$  (where  $2x + 3y \neq 0$ )

60 Factorize by taking the H.C.F :  $15xy^3 + 20x^2y - 25xy$

61 Subtract :  $7x^2 + 5x - 6$  from  $2x^2 - 3x + 5$



100

62 Simplify :  $(X + 3)^2 - 9$  , then find the numerical value when  $X = 3$



63 Use the property of distribution to find the result of :  $\frac{3}{7} \times 2 + \frac{3}{7} \times 9 - \frac{3}{7} \times 4$

64 Simplify :  
 $(3 b - 4)(3 b + 4) + 5$  , then find the numerical value of the result when  $b = - 2$

65 What is the increase of :  $4 X^2 - 6 X + 5$  than  $7 X^2 - X - 9$

66 Write four rational numbers between  $\frac{5}{4}$  and  $\frac{2}{3}$

67 If  $X = -\frac{1}{3}$  ,  $y = \frac{3}{4}$  and  $z = -3$  , find the numerical value of each of the following :

1  $X y z$

2  $X y + y z$

$\left\langle \frac{3}{4}, -\frac{5}{2} \right\rangle$

68 Divide :  $10 X^5 - 6 X^3 + 4 X^2$  by  $2 X^2$  (where  $X \neq$  zero)

69 Simplify to the simplest form :  $(X - 5)^2 + 10 X$

70 Factorize by identifying the H.C.F. :  $12 X^3 + 8 X^2 - 4 X$

71 Find the sum of :  $2 X + 7 y - 5$  and  $2 X - 7 y - 3$

72 If  $X = \frac{1}{2}$  ,  $y = -\frac{2}{3}$  ,  $z = 2$  , find the value of :  $\frac{y - z}{X}$

100

73

The table shows the distribution of marks of 30 students in an exam :

Marks	6	9	12	15	18	Total
No. of students	4	7	8	5	6	30

Find the mode mark.



74

Sameh recorded the number of minutes that the bus took for going to the school for 10 days as the following : 15 , 18 , 22 , 15 , 25 , 20 , 16 , 20 , 14 , 15

Find each of the following :

- 1 The mode number of minutes.
- 2 The arithmetic mean of the number of minutes.
- 3 The median number of minutes.

75

If  $x = \frac{2}{3}$  ,  $y = -\frac{1}{6}$  and  $z = -3$  , then find the value of each of the following :

1  $(x \div y) - (z \div y)$

2  $\frac{x+y}{xz}$

76

Find the rational number that lies one third of the way between  $\frac{4}{7}$  and  $1\frac{3}{4}$  from the smaller number.

77

Factorize the following by identifying the H.C.F. :  $15x^2y - 25xy^2 + 10xy$

78

Find the quotient of dividing :  $12x^3 + 18x^2 - 6x$  by  $6x$  (where  $x \neq 0$ )

Good luck  
**100**

**(1) Complete each of the following.**

1) The number that hasn't a multiplicative inverse is .....

2)  $\frac{3}{4} = \dots \dots \dots \%$

3)  $(2x - 3)(3x + 5) = 6x^2 + \dots \dots \dots - 15$

4)  $3x^2 + 15xy = 3x \dots \dots \dots + \dots \dots \dots$

5) If the order of the median of a set of values is the fifth, then the number of these values is .....

6) The algebraic term  $-3xy^3$  whose degree is .....

7) The arithmetic mean of the value: 3, 5, 4, 9, 4 is .....

8) If  $\frac{x}{24} = \frac{5}{12}$ , then  $x = \dots \dots \dots$

9)  $3x^2y \times \dots \dots \dots = 12x^3y$

10) If the order of the median of a set of values is the Fourteenth, then the number of these values is .....

11) The algebraic term :  $-4xy^2$  of ..... degree

12)  $|-5| + |2| = \dots \dots \dots$

13)  $6x^3 = 2x \times \dots \dots \dots$

14)  $(2x - 3)(x + 4) = 2x^2 \dots \dots \dots - 12$

15) 1, 1, 2, 3, 5, 8, ..... (in the simplest form)

16)  $3\frac{1}{4} \times \dots \dots \dots = 1$

17) If :  $\frac{a}{b} = \frac{1}{2}$  , then  $\frac{2a}{b}$  .....

18)  $6x^3 = 2x \times$  .....

19) If :  $(x - y)(3x + 2y) = 3x^2 + kxy - 2y^2$  , then  $x =$  .....

20) The rational number that lies half way between  $\frac{1}{2}$  to  $\frac{1}{4}$  in the direction of the first number is .....

21) The rational number which hasn't a multiplicative inverse is .....

22)  $\left(\frac{-5}{7}\right) \times \left(\frac{-7}{5}\right) =$  .....

23) The number that lies half the way between  $\frac{1}{2}$  to  $\frac{5}{8}$  is .....

24)  $24x^4 y^6 = 3x^2 y^3 \times$  .....

25) If the mood of the values 5 , 7 , a + 1 , 6 , 4 is 4 , then a = .....

26) If the ratio X : 25 equals 2 : 5 , then X=.....

27)  $100\% - \frac{1}{4} =$  .....

28) The greatest negative integer is .....

29)  $\frac{-4}{11} \times$  ..... =.....

30) If the sum of 5 numbers is 30 , then the arithmetic mean for these number is.....

31) The number  $\frac{4}{x}$  is a rational number if  $x \neq$  .....

32) The order of the median for the values : 4 , 12 , 9 , 8 , 2 is.....

33) If the number is Y + 5 hasn't a multiplicative inverse , then Y.....

34) The remainder of subtraction  $2x - 1$  from ..... equals  $2x$



### Choose the correct answer :

1)  $\left| \frac{-2}{3} \right|$  ..... zero

a)  $>$       b)  $<$       c)  $=$       d)  $\leq$

2) The algebraic term:  $2x^3y^2$  whose degree is .....

a) the second      b) the third      c) the fourth      d) the fifth

3) The arithmetic mean of the values: 2 , 2 , 3 , 6 , 7 is .....

a) 2      b) 3      c) 4      d) 5

4)  $(-3x^2y)^2 \times 2xy =$  .....

a)  $-18x^5y^3$       b)  $18x^5y^3$       c)  $6x^3y^2$       d) 5

5) The median of the value :  $a + 3$  ,  $a + 2$  ,  $a + 4$  (where  $a$  is a positive integer)

is 8 then  $a$  equals : .....

a) 2      b) 3      c) 4      d) 5

6)  $\frac{-3}{5} + \frac{2}{3} =$  .....

a)  $\frac{6}{5}$       b)  $\frac{1}{15}$       c) 5      d) 3

7)  $\frac{1}{x-3}$  is a rational number when .....

a)  $x = -3$       b)  $x = 3$       c)  $x \neq 3$       d)  $x = 5$

8) The mode of the values: 5 , 5 , 4 , 7 , 5 , 4 is .....

a) 2      b) 3      c) 4      d) 5

9) The highest common factor of the expression  $3x^2y - 6x$  is .....

a)  $3x$       b)  $6x$       c)  $3xy$       d)  $xy-2$

10)  $|-13| - |13| =$  .....

a) -26      b) -13      c) 0      d) 26

11) If :  $\frac{x}{y} = 1$  , then  $3x - 3y =$  .....

a) 0      b) 1      c) 3      d) 6

**12)** The remainder of subtracting  $(-5x)$  from  $3x$  equals: .....

a)  $-2x$       b)  $2x$       c)  $8x^2$       d)  $8x$

**13)** The mode of the values: 1 , 3 , 7 , 3 , 6 , 7 , 3 is .....

a) 1      b) 3      c) 6      d)      e) 7

**14)** The arithmetic mean of the numbers: 3 , 6 , 1 , 6 is .....

a) 3      b) 4      c) 6      d) 16

**15)** If  $x + \frac{3}{x} = 4 + \frac{3}{4}$ , then  $x =$  .....

a)  $\frac{1}{4}$       b)  $\frac{1}{2}$       c) 3      d) 4

**16)** The property used in the operation:  $\frac{6}{7} \times 1 = \frac{6}{7}$  is .....

a) associative      b) commutative  
c) multiplicative identity      d) multiplicative inverse

**17)** The mode of the values: 7 , 5 , y + 3 , 5 , 7 is 7, then y = .....

a) 3      b) 4      c) 5      d) 7

**18)** The median of the values: 4 , 8 , 3 , 5 , 7 is .....

a) 3      b)      c) 4      d) 5      e) 7

**19)** If  $(x - 3)(x + 3) = x^2 + K$ , then  $K =$  .....

a) -9      b) 3      c) 6      d) 9

**20)** The remainder of subtracting  $\frac{1}{3}$  from  $\frac{4}{3}$  is .....

a)  $-\frac{5}{3}$       b) 1      c)  $\frac{2}{3}$       d)  $\frac{5}{3}$

**21)**  $\frac{7}{x+5}$  is a rational number when  $x \neq$  .....

a) -5      b) 5      c)  $\frac{7}{5}$       d) 7

22) If the arithmetic mean of marks of five students is 30, then the sum of their marks is .....

a) 6      b) 30      c) 35      d) 150

23) The order of the median of the values: 6 , 2 , 5 , 4 , 1 is .....

a) 1      b) 2      c) 3      d) 4

24) If  $(x - 3)(x + 3) = x^2 + K$ , then  $K =$  .....

a)-9      b) 3      3) 6      4) 9

25) The smallest prime number is.....

a) 0      b) 1      c) 2      d) 3

26) If  $(x + y)^2 = 15$  ,  $x^2 + y^2 = 7$  , then  $xy =$  .....

1) 8      2) 22      3) 6      4) 4

27) If  $2x = 10$  , then  $\frac{3}{5}x =$  .....

1) 25      2) 15      3) 5      4) 3

28) If the order of the median for a set of ordered values is the fifth , then the number of these values is.....

1) 3      2) 5      3) 7      4) 9

5) If half of a number is 30 , then  $\frac{3}{4}$  of this number is .....

1) 48      2) 42      3) 40      4) 45

(2) [a] Find in the simplest form the value of each of the following.

1)  $-27\frac{1}{4} + 13\frac{1}{2}$

2)  $0.\dot{1}\dot{8} - 30\%$

[b] Using the properties of the rational numbers, find the value of:

$$\frac{23}{45} \times \frac{23}{45} - 2 \times \frac{23}{45} + \frac{17}{12} \times \frac{7}{12}$$

(3) [a] Subtract :  $5x^2 + y^2 - 3xy$  from  $x^2 - 2xy + 3y^2$

2) Divide:  $6x^2 + 13xy + 6y^2$  by  $2x + 3y$  ,  $2x + 3y \neq 0$

[b] Simplify:  $(2a - 3)(2a + 3) + 7$  , then find the numerical value of the result when  $a = -1$

(4) [a] Simplify to the simplest form :  $\frac{3}{7} \times \frac{5}{6} + \frac{3}{7} \times \frac{7}{6} - \frac{3}{7}$

[b] Find three rational numbers between:  $\frac{1}{2}$  ,  $\frac{1}{3}$

(5) [a] Add :  $2x - 7y + z$  To  $5z + 6y - 2x$

[b] Divide:  $6x^2y + 9xy^2 - 12x^2y^3$  by  $3xy$  ,  $3xy \neq 0$

[c] If:  $x = \frac{1}{2}$  ,  $y = \frac{-2}{3}$  ,  $z = 2$ , then find the value of  $\frac{y-z}{x}$

(6) [a] Find in the simplest form :  $(x - 2)(x + 2)$

2) Divide:  $6x^3 - 2x^2$  by  $x$  ,  $x \neq 0$

[b] Use the property of distribution to find the result of  $\frac{3}{7} \times 2 + \frac{3}{7} \times 6 - \frac{3}{7}$

(7) [a] Add :  $5x + 2y - 1$  and  $2x + 5y + 3$

[b] Subtract:  $-a^2 - 5ab + 4b^2$  From  $3a^2 - 2ab - 2b^2$

(8) [a] Factorize by identifying the H.C.F :  $3a(a - 2b) - 6b(a - 2b)$ .

[b] If the arithmetic mean of the values 8 , 7 , 9 , 4 , 3 , K+4 is 6, then find the value of K.

(9) [a] Find the value of :  $(x + 2)^2 - (x + 2)(x - 2)$

2) Add:  $3x - 2y + 5$  and  $+y - 3$ ,  $x \neq 0$

(10) [a] Find the value :  $-13\frac{7}{8} - (-6\frac{7}{8})$

[b] Use the distribution property to find the value of:

$$\frac{5}{17} \times 10 + \frac{5}{17} \times 23 + \frac{5}{17}$$

[c] The length of a rectangle is  $(2x + 5)$  cm . and its width is  $(3x + 2)$  cm .

Calculate its area



(11) [a] Find the quotient of :

$20 a^3b^2 + 15a^2b^3 + 10ab$  by  $5ab$  where  $5ab \neq 0$

Math's Team



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[b] The following table shows distribution of marks of 30 students:

Mark	6	9	12	15	17	Total
No. of stud.	4	7	8	5	6	30

Find the mode mark.

(12) [a] Find the result of the following using the highest common factor:

$$(17)^2 - 8 \times 17 + 17$$

[b] Find the quotient of :

$$x^3y^6 - 4x^2y^2 + 6xy^2 \text{ by } xy, xy \neq 0$$

(13) [a] If :  $x = \frac{3}{4}$  ,  $y = \frac{-5}{2}$  ,

Find in simplest form the value of the expression:  $\frac{x-y}{x+y}$

[b] Use the properties of addition of rational number to find the value of:

$$\frac{5}{4} + \frac{-13}{5} + \frac{-25}{4} + \frac{28}{5}$$

Math's team

(1) Complete each of the following.a) The number that hasn't a multiplicative inverse is ..... **Zero** .....

b)  $\frac{3}{4} = \dots$  **75** ..... %

c)  $(2x - 3)(3x + 5) = 6x^2 + \dots$  **X** ..... -15

d)  $3x^2 + 15xy = 3x (\dots$  **X** ..... + ..... **5Y** ..... )

e) If the order of the median of a set of values is the fifth, then the number of these values is ..... **9** .....f) The algebraic term  $-3xy^3$  whose degree is ..... **Fourth** .....g) The arithmetic mean of the value: 3 , 5 , 4 , 9 , 4 is ..... **5** .....

h) If :  $\frac{x}{24} = \frac{5}{12}$  , then  $x =$  ..... **10** .....

i)  $3x^2y \times \dots$  **4X** .....  $= 12x^3y$

j) If the order of the median of a set of values is the Fourteenth, then the number of these values is ..... **27** .....k) The algebraic term :  $-4xy^2$  of ..... **Third** ..... degree

l)  $|-5| + |2| =$  ..... **7** .....

m)  $6x^3 = 2x \times \dots$  **3x<sup>2</sup>** .....

n)  $(2x - 3)(x + 4) = 2x^2 + \dots$  **5X** ..... - 12

o) 1 , 1 , 2 , 3 , 5 , 8 , ..... **13** ..... (in the simplest form)

p)  $3\frac{1}{4} \times \dots$  **4/13** ..... = 1

q) If :  $\frac{a}{b} = \frac{1}{2}$  , then  $\frac{2a}{b} =$  ..... **1** .....

r) If :  $(x - y)(3x + 2y) = 3x^2 + kxy - 2y^2$  , then  $x = \dots$  -1

s) The rational number that lies in the half way between  $\frac{1}{2}$  and  $\frac{1}{4}$  is  $\frac{3}{8}$

t)  $\left(\frac{-5}{7}\right) \times \left(\frac{-7}{5}\right) = \dots$  1

u)  $24x^4 y^6 = 3x^2 y^3 \times \dots$  8x<sup>2</sup> y<sup>3</sup>

v) If the mood of the values 5 , 7 , a + 1 , 6 , 4 is 4 , then a = 3

w) The rational number that lies in the one third way between  $\frac{3}{5}$  and  $\frac{4}{7}$  from the side of smaller number is  $\frac{61}{105}$

Math's Test

**(1) Choose the correct answer :**

a)  $\left| \frac{-2}{3} \right|$  ..... > ..... zero

a) >      b) <      c) =      d)  $\leq$ 

b) The algebraic term:  $2x^3y^2$  whose degree is ..... The fifth

a) the second      b) the third      c) the fourth      d) the fifth

c) The arithmetic mean of the values: 2, 2, 3, 6, 7 is ..... 4

a) 2      b) 3      c) 4      d) 5

d)  $(-3x^2y)^2 \times 2xy =$  18x^5y^3

a)  $-18x^5y^3$       b)  $18x^5y^3$       c)  $6x^3y^2$       d) 5

e) The median of the value :  $a + 3, a + 2, a + 4$  (where a is a positive integer) is 8 then a equals : 5

a) 2      b) 3      c) 4      d) 5

f)  $\frac{-3}{5} + \frac{2}{3} =$  \frac{1}{15}

a)  $\frac{6}{5}$       b)  $\frac{1}{15}$       c) 5      d) 3

g)  $\frac{1}{x-3}$  is a rational number when ..... x \neq 3

a)  $x = -3$       b)  $x = 3$       c)  $x \neq 3$       d)  $x = 5$ 

h) The mode of the values: 5, 5, 4, 7, 5, 4 is ..... 5

a) 2      b) 3      c) 4      d) 5

i) The highest common factor of the expression  $3x^2y - 6x$  is ..... 3x

a)  $3x$       b)  $6x$       c)  $3xy$       d)  $xy - 2$ 

j)  $|-13| - |13| =$  0

a) -26      b) -13      c) 0      d) 26

k) If  $\frac{x}{y} = 1$ , then  $3x - 3y =$  0

a) 0      b) 1      c) 3      d) 6

l) The remainder of subtracting  $(-5x)$  from  $3x$  equals: ... 8X

a)  $-2x$       b)  $2x$       c)  $8x^2$       d)  $8x$

m) The mode of the values: 1, 3, 7, 3, 6, 7, 3 is ... 3

a) 1      b) 3      c) 6      d)      e) 7

n) The arithmetic mean of the numbers: 3, 6, 1, 6 is ... 4

a) 3      b) 4      c) 6      d) 16

o) If  $x + \frac{3}{x} = 4 + \frac{3}{4}$ , then  $x =$  ... 4

a)  $\frac{1}{4}$       b)  $\frac{1}{2}$       c) 3      d) 4

p) The property used in the operation:  $\frac{6}{7} \times 1 = \frac{6}{7}$  is ... Multiplicative identity

a) associative      b) commutative  
c) multiplicative identity      d) multiplicative inverse

q) The mode of the values: 7, 5, y + 3, 5, 7 is 7, then y = ... 4

a) 3      b) 4      c) 5      d) 7

r) The median of the values: 4, 8, 3, 5, 7 is ... 5

a) 3      b)      c) 4      d) 5      e) 7

s) If  $(x - 3)(x + 3) = x^2 + K$ , then  $K =$  ... -9

a) -9      b) 3      c) 6      d) 9

t) The remainder of subtracting  $\frac{1}{3}$  from  $\frac{4}{3}$  is ... 1

a)  $-\frac{5}{3}$       b) 1      c)  $\frac{2}{3}$       d)  $\frac{5}{3}$

u)  $\frac{7}{x+5}$  is a rational number when  $x \neq$  ...

a) -5      b) 5      c)      d) 7

v) If the arithmetic mean of marks of five students is 30, then the sum of their marks is ... 150

a) 6      b) 30      c) 35      d) 150

w) The order of the median of the values: 6, 2, 5, 4, 1 is ... 4

a) 1      b) 2      c) 3      d) 4

**(2) Find in the simplest form the value of each of the following.**

1)  $-27\frac{1}{4} + 13\frac{1}{2}$

$$\frac{-55}{4}$$

2)  $0.\dot{1}\dot{8} - 30\%$

$$\frac{-13}{110}$$

**(3) [a] Subtract :  $5x^2 + y^2 - 3xy$  from  $x^2 - 2xy + 3y^2$**

$$-4x^2 + xy + 2y^2$$

**2) Divide:  $6x^2 + 13xy + 6y^2$  by  $2x + 3y$  ,  $2x + 3y \neq 0$**

$$3x + 2y$$

**[b] Simplify:  $(2a - 3)(2a + 3) + 7$  , then find the numerical value of the result when  $a = -1$**

$$4a^2 - 2$$

$$2$$

(4) [a] Simplify to the simplest form :  $\frac{3}{7} \times \frac{5}{6} + \frac{3}{7} \times \frac{7}{6} - \frac{3}{7}$

$$\frac{3}{7}$$

[b] Find three rational numbers between:  $\frac{1}{2}$  ,  $\frac{1}{3}$

$$\frac{21}{60}, \frac{22}{60}, \frac{23}{60}$$

(5) [a] Add :  $2x - 7y + z$  To  $5z + 6y - 2x$

$$-Y + 6Z$$

[b] Divide:  $6x^2y + 9xy^2 - 12x^2y^3$  by  $3xy$  ,  $3xy \neq 0$

$$2X + 3Y - 4XY^2$$

[c] If:  $x = \frac{1}{2}$ ,  $y = -\frac{2}{3}$ ,  $z = 2$ , then find the value of  $\frac{y-z}{x}$

$$\frac{-16}{3}$$

(6) [a] Find in the simplest form :  $(x - 2)(x + 2)$

$$x^2 - 4$$

2) Divide:  $6x^3 - 2x^2$  by  $x$  ,  $x \neq 0$

$$6x^2 - 2x$$

[b] Use the property of distribution to find the result of  $\frac{3}{7} \times 2 + \frac{3}{7} \times 6 - \frac{3}{7}$

$$3$$

(7) [a] Add :  $5x + 2y - 1$  and  $2x + 5y + 3$

7X + 7Y + 2

[b] Subtract:  $-a^2 - 5ab + 4b^2$  From  $3a^2 - 2ab - 2b^2$

4a<sup>2</sup> + 3ab - 6b<sup>2</sup>

(8) [a] Factorize by identifying the H.C.F :  $3a(a - 2b) - 6b(a - 2b)$ .

3 (a - 2b) (a - 2b)

Or 3 (a - 2b)<sup>2</sup>

[b] If the arithmetic mean of the values 8 , 7 , 9 , 4 , 3 , K+4 is 6, then find the

value of K.

1

(9) [a] Find the value of :  $(x + 2)^2 - (x + 2)(x - 2)$

4X+8

2) Add:  $3x - 2y + 5$  and  $y - 3$ ,  $x \neq 0$

3X - Y + 2

(10) [a] Find the value :  $-13\frac{7}{8} - (-6\frac{7}{8})$

-7

[b] Use the distribution property to find the value of:

$$\frac{5}{17} \times 10 + \frac{5}{17} \times 23 + \frac{5}{17}$$

10

(11) [a] Find the quotient of :

$$20 a^3b^2 + 15a^2b^3 + 10ab \text{ by } 5ab \text{ where } 5ab \neq 0$$

4a<sup>2</sup>b + 3ab<sup>2</sup> + 2

[b] The following table shows distribution of marks of 30 students:

Mark	6	9	12	15	17	Total
No. of stud.	4	7	8	5	6	30

Find the mode mark.

12

(12) [a] Find the result of the following using the highest common factor:

$$(17)^2 - 8 \times 17 + 17$$

170

[b] Find the quotient of :

$$x^3y^6 - 4x^2y^2 + 6xy^2 \text{ by } xy \quad xy \neq 0$$

**X<sup>2</sup>Y<sup>5</sup> - 4XY + 6Y**

(13) [a] If :  $x = \frac{3}{4}$

$$y = \frac{-5}{2}$$

Find in simplest form the value of the expression:  $\frac{x-y}{x+y}$

**$\frac{-13}{7}$**

[b] Use the properties of addition of rational number to find the value of:

$$\frac{5}{4} + \frac{-13}{5} + \frac{-25}{4} + \frac{28}{5}$$

**- 2**

**AL GEBRA****(1) Complete each of the following:**

(1)  $(2x - 3)(3x + 5) = 6x^2 + \dots - 15$

(2) If  $\frac{x}{24} = \frac{5}{12}$ , then  $x = \dots$

(3) The arithmetic mean of the values: 3, 5, 4, 9, 4 is  $\dots$

(4) If the order of the median of a set of values is the fourteenth, then the number of these values equals  $\dots$

(5)  $\frac{3}{4} = \dots \%$

(6)  $3x^2 + 15xy = 3x(\dots + \dots)$

(7) If  $\frac{a}{b} = \frac{1}{2}$ , then  $\frac{2a}{b} = \dots$

(8) The rational number which hasn't a multiplicative inverse is  $\dots$

(9)  $\left(\frac{-5}{7}\right) \times \left(\frac{-7}{5}\right) = \dots$

(10) If the mode of the values 5, 7,  $a + 1$ , 6, 4 is 4, then  $a = \dots$

(11)  $24x^4y^6 = 6x^2y^3 \times \dots$

(12) The number that lies half way between  $\frac{1}{2}$  and  $\frac{5}{8}$  is  $\dots$

(13) The algebraic term  $-3xy^3$  whose degree is  $\dots$

(14)  $|-5| - |2| = \dots$

(15)  $6x^3 = 2x \times \dots$

(16) 1, 1, 2, 3, 5, 8, ..... (in the same pattern)

(17)  $3\frac{1}{4} \times \dots = 1$

(18) If  $\frac{a}{b+5}$  is a rational number, then  $b \neq \dots$

(19) The multiplicative inverse of  $-\frac{1}{5}$  is .....

(20)  $3x^2 - 6xy = 3x(\dots - \dots)$

(21) The additive inverse of  $(-\frac{1}{7})$  is .....

(22)  $(2x^2y) \times \dots = 6x^2y^4$

(23) The coefficient of the algebraic term  $-x^2y$  is .....

(24) The additive identity element in  $Q$  is .....

(25) The highest common factor of the expression:  $5x^2 - 5x$  is .....

(26) If  $\frac{x-1}{x-5} \in Q$ , then  $x \neq \dots$

(27) The remainder of subtracting  $-7x^2$  from  $2x^2$  is .....

(28)  $24x^4y^6 = -6x^2y^3 \times \dots$

(29) The number  $83.7694 \approx 83.77$  to the nearest .....

(30) The degree of the algebraic term  $3x^3y^2$  is .....

(31)  $-2a^2b \div 4ab = \dots$  ( $a \neq b \neq 0$ )

(32) The median of the values: 9, 6, 7, 8, 5 is .....

(33)  $2x^2y \times \dots = 12x^2y$

(34)  $Zero \div (-14) = \dots$

(35) The mode of this number: 1, 3, 7, 3, 6, 7, 3 is .....

(36)  $(x-5)(\dots) = x^2 - 25$

(37) The additive inverse of  $(4 \times -1\frac{1}{4})$  is ..... In the simplest

(38) The highest common factor of:  $3x^2 y - 9x$  is .....

(39)  $|-13| + |13| = \dots$

(40) 0.3 in the form  $\frac{a}{b} = \dots$

**(2) Choose the correct answer:**

(1)  $\left| \frac{-2}{3} \right| \dots$  Zero

(a) >      (b) =      (c) <      (d)  $\leq$

(2) The necessary condition to make  $\frac{5}{x-3}$  a ration number is .....

(a)  $x = -3$     (b)  $x = 3$     (c)  $x \neq 3$     (d)  $x = 5$

(3) If the arithmetic mean of marks of five students is 30, then the sum of their marks is .....

(a) 6      (b) 30      (c) 35      (d) 150

(4)  $\frac{-3}{5} + \frac{2}{3} = \dots$

(a)  $\frac{6}{5}$     (b)  $\frac{1}{15}$     (c) 5    (d) 3

(5) The remainder of subtracting  $(-2x)$  from  $(4x) = \dots$

(a)  $6x$     (b)  $2x$     (c)  $-4x$     (d)  $8x$

(6) The number  $0.5 = \dots$  (in the simplest form)

(a)  $\frac{5}{10}$     (b)  $\frac{1}{2}$     (c)  $\frac{9}{5}$     (d) 5

(7) The median of (4, 7, 8, 6, 5) is of order .....

(a) 3      (b) 4      (c) 5      (d) 6

(8) The degree of the algebraic expression:  $x^3 + 3x^2y^2 - x^2y$  is .....

(a) first      (b) second      (c) third      (d) fourth

(9)  $(x^2 + x) \div x = \dots$  (where  $x \neq 0$ )

(a) 0      (b)  $x$       (c)  $2x + 1$       (d)  $x + 1$

(10) If  $\frac{x}{y} = 1$ , then  $3x - 3y = \dots$

(a) zero      (b) -3      (c) -5      (d) 5

(11) The quotient of dividing  $2.25 \div 1.5 = \dots$

(a) 1.5      (b) 15      (c) 0.15      (d) 500

(12) The smallest fraction of the following is .....

(a)  $\frac{1}{2}$       (b)  $\frac{3}{4}$       (c)  $\frac{5}{8}$       (d)  $\frac{7}{10}$

(13) Half of  $2^{100}$  equals .....

(a)  $2^{98}$       (b)  $2^{99}$       (c)  $4^{100}$       (d)  $2^{50}$

(14) If  $\frac{a}{b} = \frac{1}{2}$ , then  $2a - b = \dots$

(a) 1      (b) 0      (c) 3      (d) -1

(15) If  $(x - 5)(x + 5) = x^2 - m$ , then  $m = \dots$

(a) -25      (b) zero      (c) 10      (d) 25

**(3) Simplify in the simplest form:**

(1)  $(2a - 3)(2a + 3) + 7$ , then

Find the numerical value of the result when  $a = -1$

(2)  $(x + 2)^2 - (x + 2)(x - 2)$

(3)  $(x + 3)^2 - 9$ , then find the numerical value when  $x = 3$

(4)  $2a(a - 4b) + 4b(2a - 3b)$ , then find the value of result at:  
 $a = 2, b = -1$

(5)  $0.18 - 30\%$

**(4) Subtract:**

(1)  $y^3 + 5y^2 - 5y$  from  $2y - y^3 + 5y^2$

(2)  $-2x^2 - 5xy + 4y^2$  from  $3x^2 + 2xy + 4y^2$

**(5) Divide:**

(1)  $6x^2 + 13xy + 6y^2$  by  $2x + 3y$ , Where  $2x + 3y \neq 0$

(2)  $x^2 + 5x + 6$  by  $x + 3$  (where  $x \neq -3$ )

**(6) Answer the questions:**

(1) Factorize by using (H.C.F):  $3a(a - 2b) + 7b(a - 2b)$

(2) Find three rational numbers between:  $\frac{1}{2}$  and  $\frac{1}{3}$

(3) If  $a = \frac{7}{4}$ ,  $b = \frac{-1}{2}$ , find the value of :  $(a - b) \div (a + b)$

(4) By using the highest common factor, find the result of:

$$(17)^2 - 8 \times 17 + 17$$

(5) Find the quotient:  $6x^2 - xy - 15y^2$  by  $2x + 3y$   
(where  $2x + 3y \neq 0$ )

(6) The following table shows the distribution of marks for 30 students in a test:

Marks	6	9	12	15	18	Total
No. of students	4	7	8	5	6	30

(1) Find the mean of these marks

(2) Find the mode of these marks

(7) Find the sum of:  $5x + 2y - 1$ ,  $2x - 5y + 3$ , then subtract the result from:  $6x + 7y - 6$

(8) If  $a = \frac{1}{2}$ ,  $b = -\frac{2}{3}$  and  $c = 3$ , Find the value of:  $a^2 - 2bc$

(9) Factorize by taking the H.C.F:  $15xy^3 + 20x^2y - 25xy$

(10) If  $x = \frac{3}{4}$ ,  $y = \frac{-5}{2}$ , then find in the simplest form the value of the expression :  $\frac{x - y}{x + y}$

(11) Find the number lies one fifth of the way between  $\frac{1}{4}$  and  $\frac{7}{8}$  from the side of the smaller one.

(12) Factorize the expression by identifying the H.C.F:  $12y^3 + 18y^2$

(13) Find three rational numbers that lie between:  $\frac{3}{4}$  and  $\frac{4}{3}$

(14) If  $a = \frac{7}{4}$ ,  $b = \frac{-1}{2}$ , Find the value of :  $(a - b) \div (a + b)$

## [1] Complete each of the following :

1)  $(2x - 3)(x - 5) = 2x^2 + \dots - 15$

2)  $3 \frac{1}{5} \times \dots = 1$

3)  $18x^5y^6 = 6x^2y^3 \times \dots$

4) If the order of the median of a set of values is fourteenth ,  
then the number of these values equals .....

5) 1 , 1 , 2 , 3 , 5 , 8 , ..... ( in the same pattern )

6)  $5x^2 + 15xy = 5x(\dots + \dots)$

7)  $0.26 - 30\% = \dots$

8) The remainder of subtracting  $-7x$  from  $3x$  is .....

9)  $7x^3y^2 \times \dots = 49x^3y^7$

10) The multiplicative inverse of the number  $(-\frac{11}{7})^{\text{zero}}$  is .....

11) If the mode of the values 7 , 1 ,  $a + 2$  , 1 , 7 is 7 then  $a = \dots$

12) If  $\triangle + \square = 20$  ,  $\triangle + \triangle + \square = 35$  , then  $\square = \dots$

13) The number that lies at half way between  $\frac{1}{2}$  and  $\frac{5}{8}$  is .....

14)  $\frac{3}{4} + 50\% = \dots$

15) The degree of the algebraic term :  $-9x^2y^2$  is .....

16) The median of the values : 4 , 8 , 3 , 5 , 7 is .....

17) 15 % of 600 kg = ..... kg

18) The arithmetic mean of the values : 2 , 3 , 2 , 6 , 7 is .....

19) The rational number that lies one third of the way between 8 and  
12 from the smaller number is .....

20) The rational number which hasn't a multiplicative inverse is .....

21)  $8b^3 = 2b \times \dots$

22)  $(2x - 3)(3x + 5) = 6x^2 + \dots - \dots$

23) The arithmetic mean of the numbers 10 , 4 , 7 , 3 , 1 is .....

24) The most repeated value of a set of values is called .....

25)  $\frac{2}{5} = \dots \%$

26) If  $\frac{5}{a+2}$  is a rational number then  $a \neq \dots$

27) The additive inverse of the number  $|- \frac{2}{3}|$  is .....

28) The smallest natural number is .....

29) If the arithmetic mean of the values : 8 ,  $x$  , 7 , 5 is 6 , then  $x = \dots$

30) The additive inverse of  $[4 \times (-1 \frac{1}{4})]$  is .....

31) If  $(x - y)(3x + 2y) = 3x^2 + kxy - 2y^2$ , then  $k = \dots$

32) If  $\frac{4}{6} = \frac{12}{x}$ , then  $x + 2 = \dots$

33) The rational number in half way between  $\frac{3}{5}$  and  $\frac{4}{5}$  is .....

34) If three times a number is 15 , then fifth this number is .....

35) If  $a + 3b = 7$  , and  $c = 3$  , then the numerical value of :  
 $a + 3(b + c)$  is .....

**[2] Choose the correct answer :**

36)  $0.7 + 0.3 = \dots$  ( 1 , 3.7 , 0.37 ,  $1\frac{1}{3}$  )

37) The multiplicative inverse of the number  $(\frac{1}{3})^0$  is .....

( 3 , -3 , 1 , -1 )

38) The algebraic term  $5A^3B^2$  is of the ..... degree .  
 ( third , fourth , fifth , sixth )

39) If the arithmetic mean of the values 3, 5, and  $x + 2$  is 4 then the arithmetic mean of the two values  $5 - x$ ,  $5 + 2x$  is ....  
 ( 6, 4, 3, 2 )

40) If  $\frac{2}{5}x = 10$ , then  $\frac{3}{5}x = \dots$  ( 25, 15, 5, 20 )

41) If the mode of the values 7, 5,  $x + 4$ , 5, 7 is 5, then  $x = \dots$  ( 1, 4, 5, 7 )

42) The median of the values 5, 4, 7 is ....  
 ( 4, 5, 16, 7 )

43) The rational number of that lies one third of the way between 8 and 12 from the smaller is .... (  $8\frac{1}{3}$ ,  $10\frac{2}{3}$ , 10,  $9\frac{1}{3}$  )

44) If  $\frac{7}{x+3}$  is a rational number, then  $x \neq \dots$ .  
 ( -3, 0, 3, 7 )

45) If  $\Delta + \square = 15$ ,  $\Delta + \Delta + \square = 20$ , then  $\Delta = \dots$   
 ( 15, 5, 20, 10 )

46) The rational number that lies in half way between  $\frac{1}{3}$  and  $\frac{5}{9}$  is..  
 (  $\frac{4}{9}$ ,  $\frac{2}{3}$ ,  $\frac{5}{27}$ ,  $\frac{3}{4}$  )

47) The arithmetic mean of the values 1, 6, 4, 8, 6 is ....  
 ( 6, 5, 8, 25 )

48)  $(-3x) \times (-5y) = \dots$  (  $-8xy$ ,  $-15xy$ ,  $15xy$ ,  $8xy$  )

49) The number  $\frac{2}{9a}$  is a rational number if  $a \neq \dots$ .  
 ( 2, 0, -9, 9 )

50)  $|-5| - |2| = \dots$  ( -3, 10, -7, 3 )

51) The number  $\frac{5}{3} > \dots$  (  $\frac{25}{9}, \frac{10}{3}, \frac{3}{5}, \frac{10}{6}$  )

52) The order of the median of the values : 6, 2, 5, 4, 1 is ....  
( first, second, third, fourth )

53) The remainder of subtracting  $9x$  from  $7x$  equals ....  
(  $2x, -2x, 16x, -2$  )

54) If  $\frac{x}{y} = 1$  then  $3x - 3y = \dots$  ( 0, 1, 6, 3 )

55) If 6, 5, 12 and  $x$  are proportional numbers then  $x = \dots$   
( 5, 8, 10, 7 )

56) The H.C.F of :  $10x^2 + 5x = \dots$  (  $5x, 2x, 5, x$  )

57) If  $\frac{5}{x+2}$  is a rational number, then  $x \neq \dots$   
( -2, zero, 2, 5 )

58) If  $3a = 27$  and  $a/b = 1$  then  $b = \dots$  ( 9, 5,  $\frac{1}{5}$ ,  $\frac{1}{9}$  )

59) The coefficient of the algebraic term  $-5x^2y$  is ....  
( -5, 5, 3, -3 )

60) If the mode of the values 7, 5,  $x+4$ , 5, 7 is 5 then  $x = \dots$   
( 1, 4, 5, 7 )

61) If the rational number  $\frac{2-x}{x-3} = 0$ , then  $x = \dots$   
( 2, -2, 3, -3 )

62) The mode of the values 4, 5, 4, 3, 7, 5, 4 is ....  
( 3, 4, 5, 7 )

63)  $(15x^4 + 5x^3) \div 5x^3 = \dots$   
(  $3x^2 + x, 5x^2 + 1, 3x + 1, 4x^4$  )

64)  $|\frac{-5}{3}| \dots \text{zero}$  (  $<, >, =, \leq$  )

65)  $2ab^2 \div \text{zero} = \dots$  ( zero,  $ab$ , undefined,  $2ab^2$  )

66)  $(x+y)(x-y) = \dots$  (  $2x$ ,  $(x-y)^2$ ,  $x^2$ ,  $x^2 - y^2$  )

67) The quotient of dividing  $2.25 \div 1.5 = \dots$   
 ( 1.5, 15, 0.15, 500 )

68) The additive inverse of the number  $(\frac{1}{2})^{\text{zero}}$  is  $\dots$ .  
 ( 2, -1, 1, -2 )

69)  $(x^2 + x) \div x = \dots$  ( zero,  $x$ ,  $2x+1$ ,  $x+1$  )

70) If  $a \times \frac{b}{3} = \frac{a}{3}$ , then  $b = \dots$  (  $\frac{a}{3}$ , 0,  $a$ , 1 )

**[3] Answer the following :**

71) Simplify to the simplest form :  $(x-3)(x+3) + 9$ , then  
 Calculate the numerical value of the result when  $x = 5$

72) Using the distribution property, find the value of :  

$$\frac{3}{7} \times 2 + \frac{3}{7} \times 6 - \frac{3}{7}$$

73) Find three rational numbers that lie between :  $\frac{1}{2}$  and  $\frac{1}{3}$

74) Subtract :  $5x^2 + y^2 - 3xy + 1$  from  $6x^2 - 2xy + 3y^2$

75) What is the increase of :  $7x + 5y + z$  than  $2x + 6y + z$  ?

76) Divide :  $14x^2y - 35xy^2 + 7xy$  by  $7xy$  where  $x \neq 0$  and  $y \neq 0$

77) If the arithmetic mean of the numbers : 8, 7, 5, 9, 4, 3,  $k+4$  is 6, then find the value of :  $k$

78) If  $x = \frac{1}{2}$ ,  $y = \frac{-2}{3}$ ,  $z = 2$  find the value of  $\frac{y-z}{x}$

79) Factorize by identifying the H.C.F:  $3 a (a - 2 b) - 6 b (a - 2 b)$   
 then find the value of the result when  $(a - 2 b) = \left| -\frac{1}{3} \right|$

80) The following table shows Omar's marks in 6 mathematics examinations :  
 Find each of the median mark and the mean mark .

Month	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.
Mark	41	35	47	37	44	48

81) Divide :  $2 x^3 + 3 x^2 - 4 x - 6$  by  $2 x + 3$  ( where  $x \neq \frac{3}{2}$  )

82) Add :  $5 x + 2 y - 1$  and  $2 x - 5 y + 3$

83) Use the distribution property to find the value of :

$$\frac{7}{12} \times \frac{23}{45} + \frac{17}{12} \times \frac{23}{45} - 2 \times \frac{23}{45}$$

84) (a) find the mode of : 2 , 4 , 7 , 4 , 5

(b) find the median of : 4 , 8 , 3 , 5 , 7

85) If  $x = \frac{5}{9}$  ,  $y = \frac{4}{3}$  ,  $z = \frac{1}{9}$  , find in the simplest form the value of  $(x + z) \div y$  ( show the steps )

86) Factorize by taking out the H.C.F :  $3 x^2 y - 6 x y^2 + 9 x y$

87) Find three rational numbers between :  $\frac{4}{5}$  and  $\frac{2}{3}$

88) Subtract :  $-a^2 - 5ab + 4b^2$  from  $3a^2 - 2ab + 5b^2$

89) Simplify :  $(x + 2)^2 - 4x$  , then find the numerical value of the result when  $x = 1$

90) Use the property of distribution to find the value of :

$$\frac{6}{37} \times 7 + \frac{6}{37} \times 5 + \frac{6}{37} \times (-11)$$

91) The following table shows Gehad's marks in mathematics exam in 6 months :

Month	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.
Mark	30	35	42	37	44	40

Find the arithmetic mean of the marks .

92) Simplify to the simplest form  $(y - 3)(y + 3) + 9$

93) What is the increase of :  $7x + 5y + 2$  than  $2x + 6y + 7$  ?

94) Find k if the arithmetic mean of the values :

$27, 8, 16, 24, 6, k$  is 14

95) Find the quotient :  $2x^2 + 13x + 15$  by  $x + 5$

96) Factorize by taking out the H.C.F :

$$3m^4n^2 - 6m^3n^3 + 9m^2n^4$$

97) Simplify :  $(2x + 3)^2 - 12x$  , then find the numerical value of the result at  $x = -2$

98) Add :  $3x - 2y + 5$  and  $x + 2y - 2$

99) Find four rational numbers between : zero and  $\frac{1}{2}$

100) The following table shows a student's marks of science in 6 months :

Month	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.
Mark	41	35	47	37	44	48

Find : (1) The median for the previous marks .  
 (2) The mean for the previous marks .

## Answers

1	$(-13X)$	2	$\frac{5}{16}$
3	$3 X^3 y^3$	4	27
5	13	6	$( X+3y )$
7	-0.04	8	$3x+7x=10x$
9	$7 y^5$	10	1
11	$A=5$	12	6
13	$\frac{9}{16}$	14	$\frac{5}{4}$
15	third	16	5
17	90kg	18	4
19	$9\frac{1}{3}$	20	0
21	$4 b^2$	22	$6X^2+ X -15$
23	5	24	Mode
25	40	26	-2
27	$-\frac{2}{3}$	28	0

29	4	30	5
31	-1	32	20
33	$\frac{35}{50} = \frac{7}{10}$	34	$3x=15$ $x=5$ $\frac{1}{5} \times 5 = 1$
35	$7+9=16$	36	1
37	1	38	fifth
39	$x=2$ , so $\frac{12}{2} = 6$	40	15

41	$x=1$	42	5
43	$9\frac{1}{3}$	44	-3
45	5	46	$\frac{4}{9}$
47	$\frac{25}{5} = 5$	48	$15xy$
49	0	50	3
51	$\frac{3}{5}$	52	third
53	$-2x$	54	0
55	10	56	$5x$

57	-2	58	$\frac{1}{9}$
59	-5	60	$x=1$
61	$x=2$	62	4
63	$3x+1$	64	>
65	undefined	66	$x^2 - y^2$
67	1.5	68	-1
69	$x+1$	70	1
71	$x^2 - 9 + 9 = x^2$ Numerical value = 25	72	$\frac{3}{7} (2+6-1) = 3$
73	$\frac{21}{60} \frac{22}{60} \frac{23}{60}$	74	$x^2 + xy + 2y^2 - 1$
75	$5x - y$	76	$2x - 5y + 1$
77	$6 = \frac{k+40}{7}$ k=2	78	$(\frac{-2}{3} - 2) \div \frac{1}{2} = \frac{-16}{3}$
79	$\frac{1}{3} (3a - 6b) = a - 2b$	80	$\frac{41+44}{2} = \frac{85}{2} = 42.5$
81	$x^2 - 2$		
82	$7x - 3y + 2$		

83  $\frac{23}{45} \left( \frac{7}{12} + \frac{17}{12} - 2 \right) = \frac{23}{45} \times 0 = 0$

84 4

85  $\left( \frac{5}{9} + \frac{4}{9} \right) \div \frac{4}{3} = 1 \div \frac{4}{3} = \frac{3}{4}$

86  $3xy(x-2y+3)$

87  $\frac{101}{150} \quad \frac{102}{150} \quad \frac{103}{150}$

88  $4a^2 + 3ab + b^2$

89  $x^2 + 4x + 4 - 4x = x^2 + 4$

90  $\frac{6}{37} (7+5-11) = \frac{6}{37} \times 1 = \frac{6}{37}$

91  $228 \div 6 = 38$

92  $y^2 - 9 + 9 = y^2$

93  $5x - y - 5$

94  $K = 84 - 81 = 3$

95  $2x + 3$

96  $4m^2n^2(m^2 - 2mn + 3n^2)$

97  $4x^2 + 12x + 9 - 12x = 16 + 9 = 25$

98

$$4x + 3$$

99

$$\frac{1}{20}, \frac{2}{20}, \frac{3}{20}, \frac{4}{20}$$

100

$$\text{Median} = (41+45) \div 2 = 42.5$$

$$\text{The mean} = 252 \div 6 = 42$$

*With my best wishes*

*Mr. Tamer Shaban*

# FIRST: ALGEBRA

Choose the correct answer:

(1) If the mode of the values  $7, 5, x+4, 5, 7$  is 5, then  $x = \dots$

(a) 1      (b) 4      (c) 5      (d) 7

(2) The arithmetic mean of the values  $1, 6, 4, 8, 6$  is  $\dots$

(a) 25      (b) 5      (c) 6      (d) 8

(3) The algebraic term  $6x^3y^2$  is of  $\dots$  degree

(a) third      (b) fourth      (c) fifth      (d) sixth

(4) The rational number that lies between  $\frac{1}{3}$  and  $\frac{5}{9}$  is  $\dots$

(a)  $\frac{2}{3}$       (b)  $\frac{3}{4}$       (c)  $\frac{4}{9}$       (d)  $\frac{5}{27}$

(5) The multiplicative inverse of the number  $\left(\frac{1}{2}\right)^2$  is  $\dots$

(a) 4      (b) -4      (c) 2      (d) -2

(6) If  $\frac{5}{x+2}$  is a rational number, then  $x \neq \dots$

(a) -2      (b) 0      (c) 2      (d) 5

(7) The median of the values  $5, 4, 7$  is  $\dots$

(a) 4      (b) 5      (c) 7      (d) 16

(8) If  $\frac{4}{7}x = \frac{4}{7}$ , then  $x = \dots$

(a) 1      (b) 0      (c) 4      (d) 7

(9) The arithmetic mean of the values 2,3,8,2,5 is .....

a 3      b 2      c 4      d 8

(10) The additive inverse of -3 is .....

a -3      b 3      c  $\frac{1}{3}$       d  $-\frac{1}{3}$

(11) The remainder of subtracting  $7x$  from  $9x$  is .....

a  $2x$       b  $16x$       c  $-2x$       d 0

(12) The mode of the values 3,3,4,4,5,3 is .....

a 4      b 22      c 5      d 3

(13) If  $\frac{3}{x-7}$  is not a rational number, then  $x =$  .....

a 0      b 7      c -7      d -3

(14)  $7x$  exceeds  $-5x$  by .....

a  $12x$       b  $2x$       c  $-2x$       d  $-2x^2$

(15) The additive inverse of the number  $\frac{3}{7}$  is .....

a  $\frac{7}{3}$       b  $-\frac{7}{3}$       c  $-\frac{3}{7}$       d 7

(16)  $\frac{-2}{5} \times 1 = \frac{-2}{5}$  (..... property)

a commutative      c associative  
b multiplicative identity      d additive identity

(17) The additive inverse of the number  $\left(\frac{-1}{5}\right)^0$  is .....

a 1      b -1      c 5      d -5

(18)  $a + a = \dots$ 

(a)  $2a^2$

(b)  $2a$

(c)  $a^2$

(d)  $1$

(19) The degree of the algebraic expression  $5x^3 + 7x + 4$  is  $\dots$ 

(a) first

(b) second

(c) third

(d) fourth

(20) The number  $\frac{5}{12} = \dots$ 

(a)  $0.42$

(b)  $0.416$

(c)  $0.41\dot{6}$

(d)  $0.4\dot{5}$

(21) If  $\left(\frac{-4}{3}\right) + a = 0$ , then  $a = \dots$ 

(a)  $\frac{3}{4}$

(b)  $\frac{4}{3}$

(c)  $1$

(d)  $0$

(22) The H.C.F. of  $12x^3 + 6x^2$  is  $\dots$ 

(a)  $6$

(b)  $6x^2$

(c)  $x^2$

(d)  $3x^2$

Complete:

(1)	$2\frac{1}{5} \times \dots = 1$	$\frac{5}{11}$
(2)	$0.18 - 30\% = \dots$	"-0.12"
(3)	$7x^3 y^2 \times \dots = 21x^3 y^5$	" $3y^3$ "
(4)	$(2x-3)(x+5) = 2x^2 + \dots - 15$	" $7x$ "
(5)	$24x^4 y^6 = 6x^2 y^3 \times \dots$	" $4x^2 y^3$ "
(6)	The remainder of subtracting $-3x$ from $2x$ is $\dots$	" $5x$ "
(7)	1, 1, 2, 3, 5, 8, $\dots$ (in the same pattern)	"13"
(8)	If the mode of the values 7, 5, $a+3$ , 5, 7 is 7, then $a = \dots$	"4"

(9)	$5x^2 + 15 \times y = 5 \times (\dots + \dots)$	" $x + 3y$ "
(10)	The algebraic term $5 \times y$ is of the ..... degree.	"second"
(11)	$(x-3)(\dots + \dots) = x^2 - 9$	" $x + 3$ "
(12)	The rational number which hasn't a multiplicative inverse is .....	"0"
(13)	The median of the values 3, 5, 4 is .....	"4"
(14)	If $\frac{x-7}{5} = 0$ , then $x = \dots$	"7"
(15)	$3x^2 + 15y = \dots (x^2 + 5y)$	"3"
(16)	$(3x+5) + (4x-5) = \dots$	"7x"
(17)	$\frac{1}{2} = \dots \%$	"50"
(18)	If $\frac{a}{b} = \frac{1}{2}$ , then $\frac{2a}{b} = \dots$	"1"
(19)	The rational number $\frac{x-4}{x+5} = 0$ , then $x = \dots$	"4"
(20)	The multiplicative inverse of the number $3\frac{1}{3}$ is .....	" $\frac{3}{10}$ "
(21)	If $a \times \frac{b}{5} = \frac{a}{5}$ , then $b = \dots$	"1"
(22)	$\frac{3x}{5} - \frac{x}{5} = \dots$	" $\frac{2x}{5}$ "
(23)	The remainder of subtracting $-3x$ from $5x$ is .....	"8x"
(24)	$1\frac{1}{3} + \frac{3}{5} = \dots$	" $\frac{29}{15}$ "
(25)	$7a^3 - \dots = 3a^3$	" $4a^3$ "
(26)	The coefficient of the algebraic term $\frac{1}{3}x^4yz$ is .....	" $\frac{1}{3}$ "

(27) The multiplicative inverse of  $-\frac{1}{9}$  is ..... "9"

(28)  $x^2 + 3yx - x^2 + 2xy = \dots$  "5xy"

(29) The H.C.F. of:  $15x^3 + 5x^5$  is ..... "5x<sup>3</sup>"

**Essay problems:**

(1) Subtract  $5x^2 + y^2 - 3xy + 1$  from  $6x^2 - 2xy + 3y^2$

(2) Use the distribution property:  $\frac{27}{16} \times \frac{11}{7} + \frac{27}{16} \times \frac{11}{7} - \frac{27}{16} \times \frac{6}{7}$

(3) Simplify:  $(2x-3)(2x+3)+7$ , then calculate the numerical value of the result when  $x = -1$

(4) Divide:  $(2x^3 + 3x^2 - 4x - 6)$  by  $(2x + 3)$  where  $(x \neq -\frac{3}{2})$

(5) What is the increase of:  $7x + 5y + z$  than  $2x + 6y + z$  ?

(6) Divide:  $(14x^2y - 35xy^2 + 7xy)$  by  $(7xy)$  where  $x \neq 0$  and  $y \neq 0$

(7) If  $a = 3$ ,  $b = \frac{2}{3}$  and  $c = -\frac{4}{3}$ , find:  $c^2 - a b$

(8) Write four rational numbers between:  $\frac{3}{2}$  and  $\frac{3}{4}$ .

(9) Add  $(3a - 7b - 5c)$  to  $(-a + c + 4b)$

(10) Use the distribution property:  $6 \times \frac{5}{7} + 2 \times \frac{5}{7} - \frac{5}{7}$ .

(11) Find the rational number which lies at the fourth way between  $\frac{1}{7}$  and  $\frac{3}{7}$  from the side of the smaller number.

(12) Subtract:  $(x - 5xy + y)$  from  $(2x - xy + 4y)$

(13) Simplify:  $(x-3)(x+3) + 9$ , then find the numerical value of the result when  $x = 5$

(14) Factorize by identifying H.C.F.:  $4x^2y^3 - 2xy^2 + 6x^3y$

(15) If the arithmetic mean of the numbers: 8, 7, 5, 9, 4, 3, k+4 is 6, then find the value of k.

(16) The following table shows Ahmed's marks in Mathematics exam in 6 months:

Month	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
Mark	30	35	42	37	44	50

Find the arithmetic mean of the marks.

(17) The following frequency distribution shows the marks of 40 pupils in an exam:

Mark	15	16	17	18	19	20
Freq.	4	5	8	12	7	4

Find the mode mark.



### Part (1)

#### Exercise (1)

##### **(1) Complete each of the following:**

- 1) The multiplicative inverse of the number  $\frac{-9}{8}$  is .....
- 2) If  $\frac{a}{b} = \frac{2}{3}$ , then  $\frac{3a}{2b} =$  .....
- 3) The remainder of subtracting  $\left(\frac{1}{5}\right)$  from  $\left(-\frac{2}{5}\right)$  equals .....
- 4) The simplest form of the expression:  $\frac{3}{4} \times \left(\frac{1}{2} - \frac{1}{3}\right)$  is .....
- 5) The rational number half way between  $-\frac{5}{2}$  and  $-\frac{3}{2}$  is .....

##### **(2) Choose the correct answer from those given:**

- 1) If  $\frac{15}{x} = \frac{-3}{4}$ , then  $x =$  .....
- a) - 20      b) - 5      c) 5      d) 20
- 2) The number  $= \frac{-9}{-7}$  is the additive inverse of the number: .....
- a)  $\frac{-9}{7}$       b)  $\frac{-7}{9}$       c)  $\frac{7}{9}$       d)  $\frac{9}{7}$
- 3) If  $5x - 3y = 0$ , then  $x : y =$  .....
- a) 5 : 3      b) 3 : 5      c) - 5 : 3      d) - 3 : 5
- 4) If  $a \times \frac{b}{3} = \frac{a}{3}$ , then b equals: .....
- a) - a      b) 1      c)  $\frac{a}{3}$       d) a
- 5) The number  $\frac{5}{3} >$  .....
- a)  $\frac{10}{3}$       b)  $\frac{25}{9}$       c)  $\frac{10}{6}$       d)  $\frac{3}{5}$



### (3) Answer the following:

1) Complete in the same pattern:

$$7, 6\frac{1}{3}, 5\frac{2}{3}, 4\frac{1}{3}, \dots, \dots, 1\frac{2}{3}$$

2) Use the property of distribution to calculate the value of:

$$\frac{6}{37} \times 7 + \frac{6}{37} \times 5 + \frac{6}{37} \times (-11)$$

3) If  $-3\frac{4}{7} \times x = -3\frac{4}{7}$ , then find the value of  $x$ .

4) If  $x = \frac{3}{2}$ ,  $y = -\frac{1}{4}$  and  $z = -2$ , then find the numerical value of:

$$x - (z \div y)$$

5) The ratio between exports and imports in one year is  $3 : 4$ , if exports increased by 20% and imports decreased by 10% in the next year. Find the ratio between exports and imports in the last year.

### Exercise (2)

#### (1) Complete the following:

1) The additive inverse of the number  $\frac{7}{25} \times (-5)^2$  is .....

2)  $3 \times \dots = 1$

3) If  $\frac{x-5}{x-7} = 0$ , then  $x = \dots$

4) The rational number which hasn't a multiplicative inverse is .....

5) If  $\frac{x}{2} + \frac{5}{7} = \frac{10}{35}$ , then  $2x$  equals .....



**(2) Choose the correct answer from those given:**

1)  $\frac{5}{8} - \frac{1}{8} > \dots$

a) 1

b)  $\frac{3}{4}$

c)  $\frac{1}{2}$

d)  $\frac{1}{4}$

2) The number of integers lying between  $\frac{7}{4}, \frac{11}{8}$  is  $\dots$

a) zero

b) 1

c) 2

d) infinite number

3) The rational number  $\frac{x}{-5}$  is negative if  $x = \dots$

a) > zero

b) < zero

c)  $\leq$  zero

d) = zero

4) The remainders of dividing four consecutive integers by the number 3 respectively may be:

a) 1, 2, 3, 1

b) 1, 2, 3, 4

c) 0, 1, 2, 3

d) 0, 1, 2, 0

**(3) Answer the following questions:**

1) Complete in the same pattern:

$$\dots, \frac{2}{2}, \frac{3}{4}, \frac{4}{8}, \frac{5}{16}, \dots, \dots, \frac{8}{128}$$

2) If  $x = -\frac{1}{3}$ ,  $y = \frac{3}{4}$  and  $z = -3$  then find the value of:

First:  $(x + y) \div z$       second:  $xy + yz$

3) If the two rational numbers  $\frac{3x}{4}$  and  $\frac{2}{3}$  are equal then find the value of  $x$ .

4) Find the value of the expression:  $\frac{1}{3} \times \left(-\frac{1}{3}\right) \div \left(-\frac{1}{3}\right) \times \frac{1}{5}$

5) Find the rational number that lies two third of the way from  $\frac{4}{7}$  to

$1 \frac{3}{4}$  from the smallest.



### Exercise (3)

#### **(1) Complete the following:**

1)  $\frac{3}{5} + \frac{7}{10} + \left(-\frac{1}{2}\right) = \dots$

2)  $\frac{4}{25} = \frac{2}{5} \times \frac{\dots}{35}$

3)  $\left(\frac{2}{7} + \frac{3}{5}\right)$  is the multiplicative inverse of the rational number  $\dots$

4) The rational number that lies half way between  $\frac{3}{7}$  and  $\frac{6}{7}$  is  $\dots$

5)  $\frac{2}{3} \left(2 + \frac{1}{2}\right) = \frac{2}{3} \times 2 + \frac{2}{3} \times \dots$

#### **(2) Choose the correct answer from those given:**

1) If  $\frac{7}{x+5}$  is a rational number, then  $x \neq \dots$

a) -5      b) 0      c) 2      d) 10

2) If  $x = 3$ ,  $y = 4$  and  $z = 6$ , then  $\frac{x}{y} - \frac{z}{x}$  equals:

a)  $-1\frac{1}{4}$       b)  $\frac{1}{4}$       c)  $\frac{5}{4}$       d)  $1\frac{3}{4}$

3) The remainder of subtracting  $\frac{3}{7}$  from  $\frac{9}{21}$  equals:

a) zero      b)  $\frac{6}{21}$       c)  $\frac{6}{14}$       d)  $\frac{12}{28}$

4) If  $3a = 27$  and  $ab = 1$ , then  $b = \dots$

a)  $\frac{1}{9}$       b)  $\frac{1}{5}$       c) 5      d) 9

5) Which of the following relations is true, where  $x = 3$ ,  $y = 5$ ,  $z = 15$

a)  $y = xz$       b)  $x = yz$       c)  $y = \frac{z}{x}$       d)  $z = \frac{y}{x}$

#### **(3) Answer the following questions:**

1) Arrange the following rational numbers in a descending order:

$$\frac{3}{10}, \frac{7}{30}, \frac{1}{3}, \frac{1}{5}, \frac{4}{15}$$

2) If  $x = -\frac{7}{4} \times -\frac{4}{7}$ , then find the value of  $x$

3) Find the result of:  $\frac{7}{12} \times \frac{23}{45} + \frac{7}{12} \times \frac{23}{45} - 2 \times \frac{23}{45}$

4) If  $x = \frac{2}{3}$ ,  $y = -\frac{1}{6}$ ,  $z = -3$ , then find:  $(x \div y) - (z \div y)$

5) Find the number one fourth of the way from  $-\frac{1}{9}$  to  $-\frac{7}{8}$



### Exercise (4)

**(1) Complete each of the following:**

- 1) The degree of the term  $-3a^2b$  is ..... and its coefficient is .....
- 2) The increase of  $7x$  than  $10x$  is .....
- 3) The perimeter of the rectangle whose dimensions are  $(2x + 1)$  and  $(2 - x)$  equals ..... unit length.
- 4)  $\frac{1}{2} \times \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} \times \dots \times \frac{49}{50} = \dots$

**(2) Choose the correct answer from those given:**

- 1) The algebraic expression  $x^3 - 3x^2 + 4$  is of the ..... degree.
  - a) first
  - b) second
  - c) third
  - d) fourth
- 2)  $2x + 3y$  is greater than  $3y - 2x$  by .....
  - a)  $-6y$
  - b)  $-4x$
  - c)  $4x$
  - d)  $6y$
- 3)  $\frac{3x}{5} - \frac{x}{5}$  equals:
  - a)  $\frac{2}{5}$
  - b)  $\frac{x}{5}$
  - c)  $\frac{2x}{5}$
  - d)  $2x$

**(3) Simplify to simplest form:  $5x + 10y + 6x - 3y + 7y - 4x$**

**(4) Find four rational numbers between  $\frac{1}{3}$  and  $\frac{7}{9}$**

**(5) A rational number, if it is subtracted from its additive inverse, the result will be  $\frac{3}{2}$  what is the number?**



### Exercise (5)

**(1) Choose the correct answer from those given:**

- 1) The rational number  $\frac{x}{-5}$  is negative if x :  
 a) > zero      b) < zero      c)  $\leq$  zero      d) zero
- 2) If  $a = 0$  ,  $b = 5$  and  $c = 2$  , then the numerical value of  $a^2b + ac$  equals :  
 a) 0      b) 2      c) 7      d) 10
- 3) If  $\frac{a}{b} = 60$  ,  $\frac{a}{3b}$  then equals:  
 a) 17      b) 20      c) 23      d) 180

**(2) 1) Find the result of:  $19 \times 17 + 19 \times 8 - 19 \times 15$**

by identifying the common factor.

- 2) If  $x = -\frac{1}{3}$  ,  $y = \frac{3}{4}$  and  $z = -3$  , find the value of:  
 a)  $x^2yz$       b)  $xy + yz$       c)  $x + y - z$

**(3) 1) Divide:  $x^3y - 4xy^2 + 6xy$  by  $xy$**

- 2) What is the increase of  $3x^2 - 5x + 2$  than the sum of:

$x + 5x^2 + 1$  and  $2x^2 - 4 - 2x$

- 3) Simplify to the simplest form:  $\left(\frac{1}{3}\right)^2 \times \left(\frac{-1}{3}\right)^3 \div \left(\frac{-1}{3}\right)^4 \times \left(\frac{1}{5}\right)^0$

**(4) 1) Find the product:  $(2x - 3y)(3x + 7y)$**

- 2) Simplify to simplest form:  $\frac{(17)^2 - 2 \times 17 + 17}{17}$

- 3) If  $a = 3x$  ,  $b = x + 2$  and  $c = 2x - 3$

Calculate the numerical value of the expression:  $ab - c^2$  when  $x = 0$



### Exercise (6)

#### (1) Complete each of the following:

- 1) The degree of the algebraic term  $-2x^2y$  is ..... and its coefficient is .....
- 2)  $(4x^2 + 2x) \div 2x = \dots$
- 3) If  $a + 3b = 7$  and  $c = 3$  , then the value of the expression  $a + 3(b + c) = \dots$
- 4) The seventh term in the pattern  $\frac{1}{10000}, \frac{1}{1000}, \frac{1}{100}, \dots$  is .....
- 5) If  $x + y = 5$  , then the numerical value of  $x^2 + 2xy + y^2$  is .....

#### (2) Choose the correct answer from those given:

- 1) If  $(x + 4)(x - 3) = x^2 + m - 12$  , then m equals: .....
  - a)  $-7x$
  - b)  $-x$
  - c)  $x$
  - d)  $7x$
- 2) If  $(x + y)^2 = 15$  and  $x^2 + y^2 = 9$  , then  $xy = \dots$ 
  - a) 1
  - b) 2
  - c) 3
  - d) 4
- 3) A rectangle whose length is  $6\ell$  and its width is 3 m , then its perimeter is .....
  - a)  $9\ell m$
  - b)  $18\ell m$
  - c)  $3(2\ell + m)$
  - d)  $6(2\ell + m)$
- 4) If  $x = 3$  ,  $y = 4$  and  $z = 6$ , then  $\frac{x}{y} - \frac{z}{x}$  equals: .....
  - a)  $-\frac{5}{4}$
  - b)  $\frac{1}{4}$
  - c)  $\frac{5}{4}$
  - d)  $\frac{7}{4}$
- 5) The relation which represents the uniform velocity of a car covered a distance (s) in a time (t) is:
  - a)  $\frac{t}{s}$
  - b)  $\frac{s}{t}$
  - c)  $ts$
  - d)  $t + s$



### (3)

- 1) Simplify to simplest form:  $3a(2a + 3b) - 2b(2a + 3b)$
- 2) Simplify the expression  $\frac{6x^3y + 9y^3x}{3xy}$  to the simplest form.
- 3) Find the product:  $(x + 1)(x^2 - x + 1)$

### (4)

- 1) What is the decrease of  $2a - 8b - c$  than the sum of  $3a - 3b + c$  and  $2a - 4b - 8c$
- 2) Factorize by identifying the highest common factor:  

$$5(48)^2 + 7 \times 48 + 53 \times 48$$
- 3) Find the result  $201 \times 199$  as ad: difference of two squares.



## Part (2)

### Exercise (1)

**(1) Complete each of the following:**

- 1) If  $3a \times k = 12a^3$ , then  $k = \dots$
- 2)  $\dots (3x + \dots) = 9x^2 + 15xy$
- 3)  $4a^2 + 8ab = 4a (\dots + \dots)$
- 4)  $(4a^2 + 2a) \div 2a = (\dots)$
- 5)  $(50 + 1)(50 - 1) = 2500 - \dots$
- 6)  $a(a + b) - b(a + b) = (a + b) \times \dots$

**(2) Choose the correct answer:**

- 1)  $-3x \times -5y$  equals
  - a)  $-15xy$
  - b)  $-8xy$
  - c)  $8xy$
  - d)  $15xy$
- 2) If  $a^2 = 25$ ,  $b^2 = 9$  and  $ab = 15$  then  $(a - b)^2 = \dots$ 
  - a)  $-4$
  - b)  $4$
  - c)  $8$
  - d)  $12$
- 3)  $(x + y)^2 - (x - y)^2$ 
  - a)  $0$
  - b)  $-2xy$
  - c)  $xy$
  - d)  $4xy$
- 4) In the opposite figure:  
Volume of the cuboid equals:  
  - a)  $6x$
  - b)  $6x^2$
  - c)  $5x^3$
  - d)  $6x^3$



**(3) Find the product:  $(2x - 3y)(2x + 3y)$**

**(4) Factorizing by identifying the H.C.F:  $27x^4 - 18x^3$**

**(5) Use the distribution property to find the value of**

$$\frac{6}{37} \times 7 + \frac{6}{37} \times 5 + \frac{6}{37} \times (-11)$$



## Exercise (2)

### (1) Complete the following:

- 1) The degree of the algebraic term  $-2x^2y$  is ..... and its coefficient is .....
- 2) The seventh term in the pattern  $\frac{1}{10000}, \frac{1}{1000}, \frac{1}{100}, \dots$  is .....
- 3) If  $a + 3b = 7$  and  $c = 3$ , then the value of the expression  $a + 3(b + c) = \dots$
- 4)  $(4x^2 + 2x) \div 2x = \dots$
- 5) If  $x + y = 5$ , then the numerical value of  $x^2 + 2xy + y^2$  is .....

### (2) Choose the correct answer:

- 1) If  $(x + 4)(x - 3) = x^2 + m - 12$ , then  $m$  equals:
  - a)  $-7x$
  - b)  $-x$
  - c)  $x$
  - d)  $7x$
- 2) If  $(x + y)^2 = 15$  and  $x^2 + y^2 = 9$ , then  $xy = \dots$ 
  - a) 1
  - b) 2
  - c) 3
  - d) y
- 3) A rectangle whose length is  $6\ell$  and its width is  $3m$ , then its perimeter is .....
  - a)  $9\ell m$
  - b)  $18\ell m$
  - c)  $3(2\ell + m)$
  - d)  $6(2\ell + m)$
- 4) If  $x = 3$ ,  $y = 4$  and  $z = 6$ , then  $\frac{x}{y} - \frac{z}{x}$  equals = .....
  - a)  $-\frac{5}{4}$
  - b)  $\frac{1}{4}$
  - c)  $\frac{5}{4}$
  - d)  $\frac{7}{4}$
- 5) The relation which represents the uniform velocity of a car covered a distance (s) in a time (t) is:
  - a)  $\frac{t}{s}$
  - b)  $\frac{s}{t}$
  - c)  $ts$
  - d)  $t + s$

### **(3) Simplify to simplest form: $4n(n + 5) + n(6 - n)$ then find the numerical value of the expression when $n = -1$**

### **(4) Simplify to simplest form: $\frac{(17)^2 - 2 \times 17 + 17}{17}$**



### Exercise (3)

**(1) Choose the correct answer from those given:**

- 1) The arithmetic mean of the set of values 19 , 32 , 27, 6, 6 is ...  
 a) 90      b) 32      c) 18      d) 6
- 2) The median of the set of values 15, 22 , 9, 11 , 33 is .....  
 a) 9      b) 15      c) 18      d) 90
- 3) The median of the set of values 34, 23, 25, 40, 22, 4 is .....  
 a) 22      b) 23      c) 24      d) 25
- 4) If the arithmetic mean of six values 12, then the sum of these values equals: .....  
 a) 2      b) 6      c) 18      d) 72
- 5) If the arithmetic mean of the values 27 , 8 , 16 , 24 , 6 , k is 14, then k equals: .....  
 a) 3      b) 6      c) 27      d) 84
- 6) If the order of the median of a set of values is the fourth, then number of these values equals: .....  
 a) 3      b) 5      c) 7      d) 9
- 7) If the order of the median of a set of values is the fifth, then number of these values equals: .....  
 a) 5      b) 6      c) 9      d) 10
- 8) If the median of the values 27 , 45 , 19 , 24 , 28 is x, then x equals: .....  
 a) 24      b) 27      c) 28      d) 45



### (2) Complete:

- 1) The mode of the values 14 , 11 , 12 , 11 , 14 , 15 , 11 is ....
- 2) If the mode of the values 15 , 9 ,  $x + 1$  , 9 , 15 is 9 , then  $x = \dots$
- 3) The arithmetic mean of the values 18 , 35 , 24 , 6 equals .....
- 4) If arithmetic mean of the numbers 3 , 3 ,  $x$  equals 4, then  $x = \dots$
- 5) If arithmetic mean of the values 9 , 6 , 5 , 14 ,  $k$  is 7, then  $k = \dots$
- 6) If the sum of live numbers is 30, then the arithmetic mean of these numbers is .....

### (3) Answer the following questions:

- 1) The following table shows the number of hours that two athletes trained in a month.

Kamal	63	70	58	30	48	53	75	72	68	46	57	66
Amer	68	56	65	70	50	49	57	62	64	54	52	63

Write the median hours of training for each athlete.

- 2) The following table shows the marks of a student in mathematics during a school year.

Month	October	November	December	March	April	May
Marks	30	34	42	36	38	50

First: Find the arithmetic mean for the marks of this student.

Second: Find the difference between the greatest and the smallest mark.



3) The students recorded the time of their bus journeys to school for 3 weeks, they wrote times as follows: 16, 18, 14, 17, 18, 15, 19, 13, 15, 22, 16, 21, 20, 13, 18  
Calculate each of the meantime, the median and the mode time.

4) If the arithmetic mean of a student's marks in five exams is 36 marks, what is the mark that he must get in the 6<sup>th</sup> exam to get his mean in the six exams 38 marks?

5) If the arithmetic mean of a student's marks in three exams (mathematics, science and social studies) is 40 marks, and his arithmetic mean in another two exams (Arabic and English) is 42 marks.  
Find the arithmetic mean of his marks in the five exams.



### Model Answers

#### Part (1)

##### Exercise (1)

###### (1) Complete:

1)  $\frac{-8}{9}$

2) 1

3)  $\frac{-3}{5}$

4)  $\frac{1}{8}$

5)  $\frac{-1}{2}$

###### (2) Choose:

1) - 20

2)  $\frac{-9}{7}$

3) 3 : 5

4)  $b = 1$

5)  $\frac{3}{5}$

###### (3)

1)  $3\frac{2}{3}$  , 3 ,  $2\frac{1}{3}$

2)  $\frac{6}{37}$

3)  $x = 1$

4)  $\frac{13}{2}$

5)  $\frac{18}{5}x$

##### Exercise (2)

###### (1) Complete:

1) - 7

2)  $\frac{1}{3}$

3)  $x = 5$

4) 0

5)  $\frac{-12}{7}$

###### (2) Choose:

1)  $> \frac{1}{4}$

2) 1

3)  $x > \text{zero}$

4) 0 , 1, 2, 0

###### (3) Answer the following questions:

1)  $\frac{6}{32}$  ,  $\frac{7}{64}$

2) First:  $\frac{-5}{36}$

Second:  $\frac{-5}{2}$

3)  $x = \frac{8}{9}$

4)  $\frac{5}{3}$

5)  $\frac{27}{28}$



### Exercise (3)

#### (1) Complete:

1)  $\frac{8}{10} = \frac{4}{5}$

2) 14

3)  $\frac{35}{31}$

4)  $\frac{9}{14}$

5)  $\frac{1}{2}$

#### (2) Choose:

1)  $x \neq -5$

2)  $\frac{3}{4} - \frac{6}{3} = -1\frac{1}{4}$

3) zero

4)  $\frac{1}{9}$

5)  $y = \frac{z}{x}$

#### (3) Answer the following questions:

1)  $\frac{1}{3}, \frac{3}{10}, \frac{4}{15}, \frac{7}{30}, \frac{1}{5}$

2) 1

3) zero

4) -22

5)  $\frac{-29}{96}$

### Exercise (4)

#### (1) Complete:

1) Third degree , - 3

2) -3 x

 3)  $2x + 6$ 

 4)  $\frac{1}{50}$ 

#### (2) Choose:

1) Third

 2)  $4x$ 

 3)  $\frac{2x}{5}$ 

 (3)  $7x + 14 y$ 

 (4)  $\frac{10}{27}, \frac{11}{27}, \frac{12}{27}, \frac{13}{27}$ 

$$\begin{array}{r}
 -5x + 3x^2 + 2 \\
 \underline{-x + 7x^2 - 3} \\
 \hline
 -4x - 4x^2 + 5
 \end{array}$$



$$\begin{array}{r}
 x + 5x^2 + 1 \\
 - 2x + 2x^2 - 4 \\
 \hline
 -x + 7x^2 - 3
 \end{array}$$

$$(5) \quad \frac{\left(\frac{1}{3}\right)^2 \times \left(\frac{-1}{3}\right)^3}{\left(\frac{-1}{3}\right)^4 \times \left(\frac{1}{5}\right)^0} = \frac{\frac{1}{9}}{\frac{-1}{3}} = \frac{1}{9} \times -3 = \frac{-1}{3}$$

### Exercise (5)

**(1) Choose:**

1) > zero      2) 0      3) 20

(2) a)  $\frac{-1}{4}$       b)  $\frac{-5}{2}$       c)  $\frac{-31}{12}$

(3) 1)  $-4x^2 - 4x + 5$

2)  $\frac{-1}{3}$

### Exercise (6)

**(1) Complete:**

1) Third degree , - 2      2) 100

**(2)**

1)  $6(2\ell + m)$       2)  $\frac{-5}{4}$       3) ts

**(3)**  $3a + b - 6c$



## Part (2)

### Exercise (1)

**(1) Complete each of the following:**

1)  $k = 4a^2$

2)  $3x, 5y$

3)  $a, 2b$

4)  $2a + 1$

5) 1

6)  $(a - b)$

**(2) Choose the correct answer:**

1) d)  $15xy$

2) b) 4

3) d)  $4xy$

4) d)  $6x^3$

(3)  $4x^2 - 9y^2$

(4)  $9x^3 (3x - 2)$

(5)  $\frac{6}{37} \times (7 + 5 + (-11)) = \frac{6}{37}$  " distribution property "

### Exercise (2)

**(1) Complete the following:**

1) 3<sup>rd</sup>, -2

2) 100

3) 16

4)  $2x + 1$

5) 25

**(2) Choose the correct answer:**

1) c) x

2) c) 3

3) d)  $6(2\ell + m)$

4) a)  $-\frac{5}{4}$

5) b)  $\frac{s}{t}$

(3)  $4n^2 + 20n + 6n - n^2$

$3n^2 + 26n$

at  $n = 1$ ,  $3x(1)^2 + 26 \times 1$

$= 3 + 26 = 29$

(4)  $17 - 2 + 1 = 16$



### Exercise (3)

**(1) Choose the correct answer from those given:**

1) c) 18	2) b) 15	3) c) 24	4) d) 72
5) a) 3	6) c) 7	7) c) 9	8) b) 27

**(2) Complete:**

1) 11	2) 8	3) 20.75
4) 6	5) 1	6) 6

**(3) Answer the following questions:**

1) Kama: 60.5      Amer: 59.5

2) First:  $\frac{30+34+42+36+38+50}{6} = 38 \frac{1}{3}$

Second:  $50 - 30 = 20$

3) mean =  $\frac{255}{15} = 17$       median = 17      mode = 18

4)  $\frac{1^{st}+2^{nd}+3^{rd}+4^{th}+5^{th}}{5} = 36$

sum =  $5 \times 36 = 180$

$\frac{180+6^{th}}{6} = 38$

$180 + 6^{th} = 228$

$6^{th} = 228 - 180 = 48$

5)  $\frac{sum}{3} = 40$  ,      sum =  $40 \times 3 = 120$

$\frac{sum}{2} = 42$  ,      sum =  $42 \times 2 = 84$

The mean of the five exams =  $\frac{120+84}{5} = \frac{204}{5} = 40.8$

# Exercises

[ B ] Choose the correct :-

1	The number $\frac{x-2}{x-9} = 0$ , then $x = \dots$				B
	A) 1	B) 2	C) 3	D) 4	
2	$0.\dot{5}\dot{7} = \dots$				B
	A) $\frac{17}{33}$	B) $\frac{19}{33}$	C) $\frac{23}{33}$	D) $\frac{87}{33}$	
3	The necessary condition to make $\frac{5}{x-1}$ a rational number is $x \neq \dots$				A
	A) 1	B) 2	C) 3	D) 4	
4	The rational number $\frac{x}{-4}$ is positive if $x$ is $\dots$				B
	A) > zero	B) < zero	C) $\geq$ zero	D) zero	
5	If $x + \frac{1}{x} = 2 + \frac{1}{2}$ , then $x = \dots$				A
	A) 2	B) 3	C) 4	D) 5	
6	If $\frac{x-2}{x-3}$ is a rational number, then $x \neq \dots$				C
	A) 1	B) 2	C) 3	D) 4	
7	$1.\dot{6} = \dots$				B
	A) $1\frac{1}{3}$	B) $1\frac{2}{3}$	C) $1\frac{2}{9}$	D) $1\frac{5}{9}$	
8	The necessary condition to make $\frac{5}{x+3}$ a rational number is $x \neq \dots$				C
	A) -1	B) -2	C) -3	D) -4	
9	If $\frac{x}{y} = 1$ , then $x - y = \dots$				B
	A) 1	B) 0	C) 3	D) 4	
Which of the following is least rational number $\dots$					
10	A) $-\frac{2}{5}$	B) $\frac{7}{5}$	C) $\frac{24}{23}$	D) $\frac{200}{201}$	A
The rational number which lies between 1 and 2 is $\dots$					
11	A) $\frac{6}{5}$	B) $\frac{2}{3}$	C) $\frac{5}{7}$	D) $\frac{3}{4}$	A

12	$-\frac{4}{7} \dots -\frac{2}{7}$	A) $>$	B) $<$	C) $=$	B	
13	$\frac{3}{7} \dots \frac{2}{5}$	A) $>$	B) $<$	C) $=$	A	
14	$-7 < \dots$	A) $-4$	B) $-7$	C) $-8$	D) $-9$	A
15	The rational number half way between : $\frac{1}{6}$ , $\frac{3}{6}$ is .....	A) $\frac{1}{2}$	B) $\frac{1}{3}$	C) $\frac{1}{4}$	D) $\frac{1}{5}$	B
16	$\frac{3}{7} \dots \frac{3}{5}$	A) $>$	B) $<$	C) $=$	B	
17	$-7 < \dots$	A) $-3$	B) $-7$	C) $-8$	D) $-9$	A
18	The rational number half way between : $\frac{1}{8}$ , $\frac{3}{8}$ is .....	A) $\frac{1}{2}$	B) $\frac{1}{3}$	C) $\frac{1}{4}$	D) $\frac{1}{5}$	C
19	$\frac{3}{7} \dots \frac{4}{5}$	A) $>$	B) $<$	C) $=$	B	
20	$-7 < \dots$	A) $-2$	B) $-7$	C) $-8$	D) $-9$	A
21	The rational number half way between : $\frac{1}{10}$ , $\frac{3}{10}$ is .....	A) $\frac{1}{2}$	B) $\frac{1}{3}$	C) $\frac{1}{4}$	D) $\frac{1}{5}$	D
22	The value of $ -2  +  -3  =$	A) 5	B) 6	C) 7	D) 8	A
23	$\frac{1}{2} + \frac{3}{4} =$	A) $\frac{5}{6}$	B) $\frac{1}{15}$	C) $\frac{5}{4}$	D) $\frac{-2}{21}$	C

24	The multiplicative identity element in $\mathbb{Q}$ is .....				B
25	A) 0	B) 1	C) -1	D) 2	C
26	The additive inverse of $(-\frac{4}{5})$ is .....				C
27	A) $\frac{3}{4}$	B) $-\frac{3}{4}$	C) $\frac{4}{5}$	D) $-\frac{4}{5}$	C
28	The additive inverse of $(-\frac{4}{5})^{\text{zero}}$ is .....				C
29	A) 0	B) 1	C) -1	D) 2	B
30	The remainder of $\frac{7}{3}$ from $\frac{5}{3}$ is .....				B
31	A) $\frac{2}{3}$	B) $-\frac{2}{3}$	C) 1	D) -1	C
32	If $\frac{a}{b} = \frac{1}{2}$ , then $2a - b =$ .....				C
33	A) 2	B) 1	C) 0	D) -1	B
34	The multiplicative inverse of -1 is .....				C
35	A) 0	B) 1	C) -1	D) 2	B
36	The multiplicative inverse of $\frac{1}{-9}$ is .....				D
37	A) 2	B) 3	C) 5	D) 9	B
38	If $\frac{x}{y} = \frac{1}{2}$ , then $\frac{2x}{y} =$ .....				C
39	A) 0	B) 1	C) -1	D) -2	B
40	If $\frac{4}{5}x = \frac{4}{5}$ then $x =$ .....				C
41	A) 0	B) -1	C) 1	D) -2	C

36	If : $\frac{7}{2} \times n = 1$ , then $n = \dots$	A) $\frac{4}{3}$	B) $\frac{5}{3}$	C) $\frac{2}{7}$	D) $\frac{7}{2}$	C
37	$-\frac{a}{b} \times -\frac{b}{a} = \dots$	A) -2	B) -3	C) -5	D) -7	B
38	$4 \times \dots = 1$	A) $\frac{1}{2}$	B) $\frac{1}{3}$	C) $\frac{1}{4}$	D) $\frac{1}{5}$	C
39	$3\frac{1}{4} \times \dots = 1$	A) $\frac{2}{3}$	B) $\frac{2}{7}$	C) $\frac{4}{13}$	D) $\frac{5}{21}$	C
40	If : $\left  -\frac{4}{5} \right  \times n = 1$ , then $n = \dots$	A) $\frac{3}{2}$	B) $\frac{4}{3}$	C) $\frac{5}{4}$	D) $\frac{5}{2}$	C
41	The rational number lying at half way between $\frac{1}{3}$ and $\frac{4}{3}$ .....	A) $\frac{11}{16}$	B) $\frac{9}{16}$	C) $\frac{5}{6}$	D) $\frac{13}{30}$	C
42	The rational number that lies one fifth of the way from $\frac{1}{2}$ to $\frac{1}{4}$ .....	A) $\frac{1}{2}$	B) $\frac{3}{8}$	C) $\frac{9}{20}$	D) $\frac{19}{40}$	C
43	The rational number that lies one fourth of the way from $\frac{1}{2}$ to $\frac{1}{4}$ .....	A) $\frac{5}{8}$	B) $\frac{13}{32}$	C) $\frac{7}{16}$	D) $\frac{15}{32}$	C
44	The rational number that lies one third of the way from $\frac{1}{2}$ to $\frac{1}{4}$ .....	A) $\frac{2}{3}$	B) $\frac{7}{24}$	C) $\frac{5}{12}$	D) $\frac{11}{24}$	C
45	The coefficient of algebraic term $7X^2y$ is .....	A) 5	B) 6	C) 7	D) 8	C
46	The degree of the algebraic term : $X^2y$ is .....	A) first	B) second	C) third	D) fourth	C

47	The algebraic term $6 a^2 b^3$ is of ..... degree	A) 5 <sup>th</sup>	B) 6 <sup>th</sup>	C) 7 <sup>th</sup>	D) 8 <sup>th</sup>	A
48	The square of the sum of X and y = .....	A) $(a+b)^2$	B) $(a+c)^2$	C) $(X+y)^2$	D) $(X+z)^2$	C
49	The algebraic expression : $X^2 + 3$ is of the ..... degree	A) first	B) second	C) third	D) fourth	B
50	$X + 4 X =$ .....	A) $2 X$	B) $3 X$	C) $4 X$	D) $5 X$	D
51	$6 X + 5 X - 7 X =$ .....	A) $X$	B) $2 X$	C) $3 X$	D) $4 X$	D
52	The increase of $(4 X^2)$ then $(-2 X^2)$ = .....	A) $5 X^2$	B) $6 X^2$	C) $3 X^2$	D) $4 X^2$	B
53	$2 X + 3 y$ is greater than $3 y - X$ by .....	A) $4 X$	B) $5 X$	C) $3 X$	D) $6 X$	C
54	The remainder of subtracting $(-4 X)$ from $3 X$ equals .....	A) $X$	B) $7 X$	C) $3 X$	D) $4 X$	B
55	$(2 X - 7)(2 X + 7) =$ ..... - 49	A) $X^2$	B) $4 X^2$	C) $9 X^2$	D) $16 X^2$	B
56	$(X - 5)(X + 5) = X^2 -$ .....	A) 25	B) 36	C) 49	D) 64	A
57	$(20 - 3)(20 + 3) = 400 -$ .....	A) 1	B) 4	C) 9	D) 16	C
58	$(X - 3)(....) = X^2 - 9$	A) $X + 1$	B) $X + 2$	C) $X + 3$	D) $X + 4$	C
59	$(X - 3)(X + ....) = X^2 -$ .....	A) 1 , 1	B) 2 , 4	C) 3 , 9	D) 4 , 16	C
60	$(2 X - 1)^2 =$ ..... - $4 X + 1$	A) $X^2$	B) $4 X^2$	C) $9 X^2$	D) $16 X^2$	B
61	$(X - 2)^2 = X^2 - 4 X +$ .....					B

	A) 1	B) 4	C) 9	D) 16	
62	The middle term of $(X - 3y)^2$ = .....				B
	A) $4Xy$	B) $6Xy$	C) $12Xy$	D) $20Xy$	
63	If: $(X + y)^2 = 13$ , $X^2 + y^2 = 9$ , then $Xy$ = .....				B
	A) 1	B) 2	C) 3	D) 4	
64	A rectangle whose length is $3L$ m and its width is $4mL$ , then its area is .....				B
	A) $12m^3L^3$	B) $12m^2L^2$	C) $56m^3L^3$	D) $56m^2L^2$	
65	$(2X + 4)(X + 1) = ..... + 6X + 4$				B
	A) $6X^2$	B) $2X^2$	C) $12X^2$	D) $15X^2$	
66	$(X + 5)(2X - 7) = 2X^2 + ..... - 35$				C
	A) $X$	B) $2X$	C) $3X$	D) $5X$	
67	$(2X^2)X(3X^2) = .....$				C
	A) $6X^2$	B) $6X^3$	C) $6X^4$	D) $6X^5$	
68	$(3a^2b^2)X(4a^2b^3) = .....$				B
	A) $10a^5b^4$	B) $12a^4b^5$	C) $12a^6b^5$	D) $10a^7b^6$	
69	$3X \times ..... = 15X^6$				D
	A) $2X^2$	B) $3X^3$	C) $4X^4$	D) $5X^5$	
70	$24X^5 \div -4X^2 = .....$				B
	A) $-8X^2$	B) $-6X^3$	C) $-4X^4$	D) $-8X$	
71	$(X^2 + X) \div X = .....$				A
	A) $X + 1$	B) $X + 2$	C) $X + 3$	D) $X + 4$	
72	$(X^2 + 3Xy) \div X = .....$				C
	A) $X + y$	B) $X + 2y$	C) $X + 3y$	D) $X + 4y$	
73	$(25X^6 + 5X^2) \div 5X^2 = .....$				D
	A) $5X + 1$	B) $5X^2 + 1$	C) $5X^3 + 1$	D) $5X^4 + 1$	
74	The highest common factor of the expression: $8X^2 - 4X$ is .....				C
	A) $2X$	B) $3X$	C) $4X$	D) $5X$	

75	The highest common factor of the expression : $8 X^2 y - 4 X y$ is .....				C
76	A) $2 X y$ B) $3 X y$ C) $4 X y$ D) $5 X y$				B
77	The H.C.F. of the expression: $3 X^4 y^2 - 6 X^2 y^2$ is .....				C
78	A) $2 X^2 y^2$ B) $3 X^2 y^2$ C) $4 X^2 y^2$ D) $5 X^2 y^2$				C
79	The expression : $a^4 + a^3 b = ( a + b )$ .....				C
80	A) $a$ B) $a^2$ C) $a^3$ D) $a^4$				C
81	If : $a + b = 5$ , then $4 a + 4 b =$ .....				C
82	A) 10      B) 15      C) 20      D) 25				C
83	$12 X^3 + 3 X^2 = 3 X^2 ( \dots + 1 )$				A
84	A) $4 X$ B) $5 X^2$ C) $5 X^3$ D) $5 X^4$				C
85	$9 a^2 + 6 a b = ( 3 a + 2 b )$				C
86	A) $4 a$ B) $2 a$ C) $3 a$ D) $5 a$				C
87	The range of the values 2 , 1 , 8 , 13 , 13 and 5 is .....				C
88	A) 10      B) 11      C) 12      D) 13				C
89	The mode of the numbers : 3 , 4 , 5 , 6 , 7 and 5 is .....				C
90	A) 3      B) 4      C) 5      D) 6				C
91	The mode of the numbers : 3 , 12 , 6 , $3 + X$ is 12 , then $X =$ .....				C
92	A) 7      B) 8      C) 9      D) 11				C
93	The order of the median of the values : 5 , 2 , 3 , 8 , 9 , 6 , 11 is .....				C
94	A) Second      B) third      C) fourth      D) fifth				C
95	Order of median of set of values is fourth then number of values = .....				C
96	A) 3      B) 4      C) 7      D) 6				C
97	The median of the numbers : 5 , 11 , 19 , 2 , 4 is .....				C
98	A) 7      B) 4      C) 5      D) 6				C
99	The median of the values : $a + 4$ , $a + 2$ , $a + 3$ is 7 , then $a =$ .....				C
100	A) 2      B) 3      C) 4      D) 5				C
101	The mean of the numbers : 4 , 2 , 12 is .....				C
102	A) 4      B) 5      C) 6      D) 7				C

Final Revision

in Algebra prep.(1)

1  $\frac{x}{x-3} \in \mathbb{Q}$  if  $x \neq 3$

2  $\frac{x+2}{x+4}$  is not rational number if  $x = -4$

3  $\frac{x+4}{3x} \in \mathbb{Q}$  if  $x \neq 0$

4  $\frac{x-2}{x+5} = 0$  if  $x = -2$

5  $\frac{3x-6}{x+5} = 0$  if  $x = 2$

6  $\frac{4+x}{x-2} = 0$  if  $x = -4$

1

7  $\frac{3}{5} = 60\%$   
 $= \frac{3}{5} \times 100\% = 60\%$

8  $| -0.4 | = 40\%$

$= 0.4 \times 100\% = 40\%$

9  $\frac{2}{3} = 0.\overline{6}$  as a terminating decimal  
 $= 0.666666$

10  $\frac{3}{11} = 0.\overline{27}$  as a terminating decimal  
 $= 0.27272727$

11  $0.\overline{3} = \frac{1}{3}$  in true form  
 $0.33333333 = \frac{1}{3}$   $\frac{a}{b}$

12  $0.\overline{45} = \frac{5}{11}$  in true form  
 $0.45454545 = \frac{5}{11}$   $\frac{a}{b}$

13  $1.\overline{25} = \frac{124}{99}$   
 $1.25252525 = \frac{124}{99}$

14) Find three rational numbers lying between

$$\frac{2}{5} \xrightarrow{\text{and}} \frac{3}{4}$$

Sol  $\frac{8}{20}, \frac{15}{20}$

numbers  $\frac{9}{20}, \frac{10}{20}, \frac{12}{20}$

one of them is a whole number

~~$\frac{3}{4}$~~

$$\frac{6}{8}, \frac{12}{8}$$

numbers are

$$\frac{7}{8}, \frac{9}{8}, \frac{10}{8}$$

in integer or whole

15) find four rational

numbers lying between

~~$\frac{2}{3}$  and  $\frac{4}{5}$~~

Sol  $\frac{10}{15}, \frac{12}{15}$

$$\times \frac{10}{10}$$

$$\frac{100}{150}, \frac{120}{150}$$

numbers  $\frac{101}{150}, \frac{102}{150}, \frac{104}{150}$

$$\frac{107}{150}$$

17) the additive identity element in  $\mathbb{Q}$  is zero

18) the additive

inverse

$$① \frac{3}{4} \rightarrow -\frac{3}{4}$$

$$② -\frac{4}{7} \rightarrow \frac{4}{7}$$

$$③ \left| -\frac{7}{9} \right| \rightarrow -\frac{7}{9}$$

zero

$$④ \left( \frac{3}{7} \right) \rightarrow 1 \rightarrow -1$$

16) find four rational

numbers lying between

$$\frac{3}{4}, 1 \frac{1}{2}$$
 such that

$$19) \text{ if } x + \frac{4}{5} = \frac{4}{5}$$

then  $x = 0$

(3)

20) If  $x + \frac{3}{7} = 0$

Then  $x = -\frac{3}{7}$

25) If  $x \times \frac{5}{7} = \frac{5}{7}$

Then  $x = 1$

21) The remainder of

Subtracting  $-2x$  from

$$5x = 5x - (-2x) = 7x$$

22) Subtracting  $\frac{1}{3}$  from  $\frac{3}{4}$

$$= \frac{3}{4} - \frac{1}{3} = \frac{5}{12}$$

23) The multiplicative

identity element in

Q is  $\frac{1}{1}$

24) The multiplicative

inverse of

$$\frac{3}{5} \rightarrow \frac{5}{3}$$

$$1 \frac{1}{4} = \frac{5}{4} \rightarrow \frac{4}{5}$$

$$0 \cdot 7 = \frac{7}{10} \rightarrow \frac{10}{7}$$

$$-6 = -\frac{6}{1} \rightarrow -\frac{1}{6}$$

$$\left(\frac{3}{4}\right)^0 = 1 \rightarrow 1$$

26) If  $X \times \frac{4}{7} = 1$

Then  $X = \frac{7}{4}$

27) The number which

hasn't a multiplicative  
inverse is zero

28) Using distribution

property to find

$$① \frac{3}{7} \times 6 + \frac{3}{7} \times 4 - \frac{3}{7} \times 3$$

$$= \frac{3}{7} \times (6 + 4 - 3)$$

$$= \frac{3}{7} \times 7 = 3$$

$$② 6 \times \frac{5}{9} + 13 \times \frac{5}{9} - \frac{5}{9}$$

$$= \frac{5}{9} \times (6 + 13 - 1)$$

$$= \frac{5}{9} \times 18$$

$$= \boxed{10}$$

4

3)  $17 \times 5 + 17 \times 7 - 17 \times 2$  between

$$= 17 \times (5 + 7 - 2)$$

$$= 17 \times 10 = 170$$

$$\frac{2}{5} \text{ and } \frac{3}{4}$$

sol

$$\frac{1}{3} \text{ way} = \frac{1}{3} \left| \frac{3}{4} - \frac{2}{5} \right| = \frac{7}{60}$$

4)  $75 \times 13 + 75 \times 12 + (75)$

$$= 75 \times 13 + 75 \times 12 + 75 \times 75$$

$$= 75 \times (13 + 12 + 75)$$

$$= 75 \times 160 = 7500$$

① From the side of the smaller number

$$= \frac{2}{5} + \frac{7}{60} = \frac{31}{60}$$

29) The number which lie half way between

$$\frac{2}{3} \text{ and } \frac{4}{5}$$

sol

The number

$$= \frac{1}{2} \times (\text{Sum of two numbers})$$

$$= \frac{1}{2} \times \left( \frac{2}{3} + \frac{4}{5} \right)$$

$$= \frac{11}{15}$$

31) If  $x = -\frac{1}{3}$ ,  $y = \frac{3}{4}$

$z = -3$  find

①  $x - y - x z$

$$= -\frac{1}{3} \times \frac{3}{4} - \left( -\frac{1}{3} \right) \times (-3)$$

$$= -\frac{5}{4}$$

②  $(x+y) \div z$

$$= \left( -\frac{1}{3} + \frac{3}{4} \right) \div (-3)$$

$$= -\frac{5}{36}$$

30) Find the rational number lying at the third of the way

(5)

32) the algebraic term

$5x^2y$  its coefficient

- 5 and its degree - 3  
and the number of its factors - 4

(33) the algebraic term

-  $\frac{1}{2}abc^2$  its coefficient

-  $\frac{1}{2}$  and its degree - 4th

34) the algebraic term

$3x$  its degree - 1<sup>ST</sup>

and its coefficient

(3) - -

35) the algebraic term

7 its degree zero

and its coefficient 7

and it is called absolute term

36) if the degree of the algebraic term  $4x^2ym$

is seventh then

$m = 5$

37) the algebraic

expression  $2x^2 - 5x + 7$

its degree 2<sup>nd</sup> and  
the number of its terms 3 terms

38) the algebraic expression

$2x^2y - 5xy^3 + 7xy$

is 5 - 4th degree

39)  $5ab$  is more than

$-3ab$  by - - -

$= 5ab - (-3ab)$

$= 5ab + 3ab = 8ab$

40)  $-4x$  is less than

$5x$  by - - -

$= 5x - (-4x) = 9x$

41)  $5x^2$  is less than

$2x^2$  by - - -

$= 2x^2 - 5x^2 = -3x^2$

increased } first  
more than } second

subtract } second  
decrease } (−)  
less than } first

$$(42) 3a^2bx \times 5ab^3 \\ = 15a^3b^4$$

$$(43) -12x^4y^2 \div 3x^2y^2 \\ = \frac{-12x^4y^2}{3x^2y^2} = -4x^2$$

$$(44) 18a^5b^3 = 6a^2b^2 \times 3a^3b$$

$$(45) \text{Add} \\ 5x - 4y - 6z \text{ and} \\ 3x + 2y - 2z$$

$$\underline{\text{sol}} \text{ result} = 5x - 4y - 6z \\ 3x + 2y - 2z$$

$$\underline{\hspace{10em}} \\ 8x - 2y - 8z$$

46 Add

$$-2a + 3a^2 - 7$$

$$\text{and } 5a^2 - 7a + 2$$

$$\underline{\text{sol}} \text{ result} = 3a^2 - 2a - 7$$

$$5a^2 - 7a + 2 \\ \underline{\hspace{10em}} \\ 8a^2 - 9a - 5$$

47 Find the sum of

$$5a - 2b + 4c \\ 2b - 3a - 3c \\ \underline{\hspace{10em}}$$

$$2a + 3c \\ \underline{\text{sol}} \text{ result} = 5a - 2b + 4c$$

$$-3a + 2b - 3c \\ \underline{\hspace{10em}} \\ 2a + 3c$$

$$4a + 4c$$

7

48. Subtract

$$3x - 4y - 5 \text{ from } 8x + 3y - 7$$

result =

$$\begin{array}{r} 8x + 3y - 7 \\ - 3x - 4y - 5 \\ \hline 5x + 7y - 2 \end{array}$$

49. What is the decrease of  $-2a - 3a^2 + 5$ from  $a^2 - 4a + 3$ sol

result =

$$\begin{array}{r} a^2 - 4a + 3 \\ + -3a^2 + 2a + 5 \\ \hline 4a^2 - 2a - 2 \end{array}$$

50. What is the expression

should be added to  $2x^2 - 4x - 5$ to get  $5x^2 + x - 3$ 

result =

$$\begin{array}{r} 5x^2 + x - 3 \\ - 2x^2 - 4x - 5 \\ \hline 3x^2 + 5x + 2 \end{array}$$

51. What is the increase

of  $4a - 7b + 5c$  than  $2b - 3c + a$ sol

result =

$$\begin{array}{r} 4a - 7b + 5c \\ - a + 2b - 3c \\ \hline 3a - 9b + 8c \end{array}$$

52. What is the increase of

 $5x^2 - 4x + 6$  than the sum of  $4x^2 - 3x + 2$  and  $x^2 + 6x - 1$

8

$$\text{true sum} = 4x^2 - 3x + 2$$

$$x^2 + 6x - 1$$

$$\frac{5x^2 + 3x + 1}{5x^2 + 3x + 1}$$

increase =

$$5x^2 - 4x + 6$$

$$\frac{5x^2 - 4x + 6}{5x^2 + 3x + 1}$$

$$-7x + 5$$

find the value of  
the result when

$$x = 2$$

at  $x = 2$

$$-7x + 5 = -7 \times 2 + 5 \\ -14 + 5 = -9$$

53) put in the simplest

$$\text{form} \\ 3a(2a^2 - 4a + 5)$$

$$= 6a^3 - 12a^2 + 15a$$

$$54) -3x^2y(5x - 2y - 4)$$

$$= -15x^3y + 6x^2y^2 + 12x^2y$$

$$55) 2a(3a + 5) - 3a(a + 3)$$

and find the value  
of result at  $a = 2$

$$2a(3a + 5) - 3a(a + 3)$$

$$= 6a^2 + 10a - 3a^2 - 6a$$

$$= (6a^2 - 3a^2) + (10a - 6a)$$

$$= 3a^2 + 4a$$

$$\text{at } a = 2$$

$$\text{result} = 3x(2)^2 + 4x2$$

$$= 3 \times 4 + 8 = 12 + 8 \\ = 20$$

$$56) \frac{5x}{4x} (x + 5)(x + 4)$$

$$= x^2 + 9x + 20$$

$$57) \frac{-4a}{15a} (3a - 2)(2a + 5)$$

$$= 6a^2 + 11a - 10$$

$$58) \frac{4xy}{-15xy} (3x + 2y)(2x - 5y)$$

$$= 6x^2 - 14xy - 10y^2$$

(9)

(59) 
$$(x+5)(x-5)$$

$$= x^2 - 25$$

(60) 
$$(3a-4b)(3a+4b)$$

$$= 9a^2 - 16b^2$$

(61) 
$$\left(\frac{1}{2}x - \frac{1}{3}y\right)\left(\frac{1}{2}x + \frac{1}{3}y\right)$$

$$= \frac{1}{4}x^2 - \frac{1}{9}y^2$$

(62) 
$$(x+3)^2$$

$$= x^2 + 2 \cdot x \cdot 3 + 9$$

$$= x^2 + 6x + 9$$

(63) 
$$(x-3y)^2$$

$$= x^2 - 2 \cdot x \cdot 3y + 9y^2$$

$$= x^2 - 6xy + 9y^2$$

(64) 
$$(2a-3b)^2$$

$$= 4a^2 - 2 \cdot 2a \cdot 3b + 9b^2$$

$$= 4a^2 - 12ab + 9b^2$$

(65) Find in the simplest form

(1) 
$$(x+3)(x-3) + 9$$

$$= x^2 - 9 + 9 = x^2$$

(2) 
$$(x+5)^2 - 10x$$

$$= x^2 + 2 \cdot x \cdot 5 + 25 - 10x$$

$$= x^2 + 10x + 25 - 10x$$

$$= x^2 + 25$$

Find the value of

result at  $x = 3$ 

result =  $x^2 + 25$

$$= (3)^2 + 25$$

$$= 9 + 25 = 34$$

(66) Find the product of

$$(x+3)(x^2 + 5x + 7)$$

sol 
$$x^2 + 5x + 7$$

$$\begin{array}{r}
 x+3 \\
 \hline
 x^3 + 5x^2 + 7x \\
 \hline
 3x^2 + 19x + 21 \\
 \hline
 x^3 + 8x^2 + 22x + 21
 \end{array}$$

(10)

②  $(2x-3)(x^2-3x+5)$

sol  $x^2-3x+5$

$$\begin{array}{r} x \\ 2x-3 \\ \hline \end{array}$$

$$2x^3-6x^2+10x$$

$$-3x^2+9x-15$$

$$2x^3-9x^2+19x-15$$

(61)

Find the quotient of

①  $18a^3-12a^2+15a$

by  $3a$   $a \neq 0$

sol

quotient =  $\frac{18a^3-12a^2+15a}{3a}$

$$= 6a^2-4a+5$$

at  $x=5, y=2$

result =

$$2 \times 5 - 3 \times 2 + 1$$

$$= 10 - 6 + 1 = 5$$

(68) divide

①  $x^2-5x+6$  by

$$x-2$$

$$x \neq 2$$

sol

$$\begin{array}{r} x-2 \sqrt{x^2-5x+6} \\ \underline{-x^2+2x} \\ \hline -3x+6 \\ \underline{+3x+6} \\ \hline 0 \end{array}$$

$$\text{quotient} = x-3$$

② divide

$$12x^2y-18xy^2+6xy$$

by  $6xy$  and

find the value of

result at

$$x=5, y=2$$

sol

quotient =  $\frac{12x^2y-18xy^2+6xy}{6xy}$

$$= 2x-3y+1$$

② divide

$$3a^2-11a+6$$

by  $3a-2$

$$\begin{array}{r} 3a-2 \sqrt{3a^2-11a+6} \\ \underline{-9a^2+4a} \\ \hline -9a+6 \\ \underline{+9a+6} \\ \hline 0 \end{array}$$

$$\text{quotient} = a-3$$

③ If  $a^2 + 5a - 3$  is

one of the factors  
of

$2a^3 + 11a^2 - a - 3$  find  
the other factor

sol

$$\begin{array}{r}
 a^2 + 5a - 3 \quad | \quad 2a^3 + 11a^2 - a - 3 \\
 \hline
 2a + 1 \quad | \quad 2a^3 + 10a^2 + 6a \\
 \hline
 \quad \quad \quad a^2 + 5a - 3 \\
 \quad \quad \quad - a^2 - 5a - 3 \\
 \hline
 \quad \quad \quad 0 \quad 0 \quad 0
 \end{array}$$

Other factor =  $2a + 1$

④ If  $x^2 + 8x + m$

is divisible by

sol  $x + 3$  find  $m$

$$\begin{array}{r}
 x+3 \quad | \quad x^2 + 8x + m \\
 \hline
 x+5 \quad | \quad x^2 + 3x \\
 \hline
 \quad \quad \quad 5x + m \\
 \quad \quad \quad - 5x - 15 \\
 \hline
 \quad \quad \quad m - 15 = 0 \\
 \quad \quad \quad m = 15
 \end{array}$$

⑤ Factorize by

identifying H.C.F

$$\begin{array}{r}
 8x^3 - 12x^2 + 4x^2 \\
 \hline
 2x^4 \quad | \quad 1x12 \quad | \quad x^4 \\
 \quad \quad \quad 1x8 \quad | \quad 2x6 \quad | \quad 2x2 \\
 \hline
 \quad \quad \quad 3x4
 \end{array}$$

$$= 4x^2(2x - 3 + x)$$

$$⑥ 15a^3b^4 - 12a^2b^3 + 3ab$$

$$\begin{array}{r}
 3x5 \quad | \quad 1x12 \quad | \quad 3x3 \\
 1x15 \quad | \quad 2x6 \quad | \quad 1x9 \\
 \hline
 3x4
 \end{array}$$

$$= 3a^2b(5ab^3 - 4b^2 + 3a)$$

$$⑦ 2x(3x + 5y) - 7y(3x + 5y)$$

$$= (3x + 5y)(2x - 7y)$$

⑧ The mean of  
the values

$$= \frac{\text{their sum}}{\text{their number}}$$

⑨ The mean of

4, 9, 5 is

$$\begin{aligned}
 \text{mean} &= \frac{4+9+5}{3} \\
 &= \frac{18}{3} = 6
 \end{aligned}$$

(12)

② The mean of

9, 7, 5, 11, 3

is -

$$\text{mean} = \frac{9+5+7+11+3}{5} = \frac{35}{5} = 7$$

$$\frac{6+5+k+4+8}{4} = 8$$

$$\frac{k+23}{4} = \frac{8}{1}$$

$$k+23 = 32$$

$$k = 32 - 23 = 9$$

③ The mean of

2, 9, 5, 7, 9, 10

is -

$$\text{mean} = \frac{2+9+5+7+9+10}{6} = \frac{35}{6} = 6$$

(11) The median of

8, 13, 7, 19, 22

is

~~7, 8, 13, 19, 22~~

$$\text{median} = 13$$

order of median  
is third

(13) The median of

12, 6, 22, 8, 5, 19, 3

is -

~~3, 5, 6, 8, 12, 19, 22~~

$$\text{median} = 8$$

order of median

is the fourth

(5) If the mean of

6, 5+k, 4, 8 is 8

then k =

13

72 The median of

True Values

7, 11, 9, 13, 19, 15

is

sel ~~7, 9, 11, 13, 15, 19~~

$$\text{median} = \frac{11+13}{2}$$

$$= 12$$

order of median

is third and fourth

73 If the order of

the median of some values is the seventh.

then number of values

13

74

If the median of the values

$a+4, a+2, a+3$

is 8 find a

sel  $a+2, a+3, a+4$

$$a+3 = 8$$

$$a = 8 - 3 = 5$$

75

The mode of true values is the most commonest value

76

The mode of

4, 7, 9, 4, 8, 7, 8

is

7

77

If the mode of

5, 7,  $x+2, 9, 5$  is 5 then  $x$  is

$$x+2 = 5$$

$$x = 5 - 2 = 3$$

If the mode of

4, 9,  $x-2, 5, 4$  is

4

then  $x =$

$$x-2 = 4 \quad x = 4+2 = 6$$

from the table

mark	6	7	8	9	10	/
number of students	5	7	11	6	3	/

Find the mode mark

8

## Summary of ALG. 30- (1) prep 1

### \* Rational numbers

numbers can be expressed in the form  $\frac{a}{b}$  such that  $a \neq 0$

① if  $\frac{a}{b}$  is rational number  $[ \in \mathbb{Q} ]$   
then  $b \neq 0$

ex if  $\frac{5}{x-1} \in \mathbb{Q}$  then  $x \neq 1$

يبقى ملائقي أو يبقى denominator على الـ rational

② if  $\frac{a}{b} = 0$  then  $a = 0$

ex if  $\frac{x-3}{x-5} = 0$  then  $x = 3$

يعد ملائقي = 0 denominator على الـ

③ Each integer is rational number with denominator = 1

ex  $5 = \frac{5}{1}$ ,  $0 = \frac{0}{1}$

(2)

④ The Additive identity (Additive neutral) in  $\mathbb{Q}$  is Zero

⑤ The Additive inverse to  $\frac{5}{7}$  is  $-\frac{5}{7}$

⑥ Any rational number + Add. inv. = 0  

$$-\frac{5}{7} + \frac{5}{7} = 0$$

⑦ The Multiplicative identity (Multi. neutral) in  $\mathbb{Q}$  is 1

⑧ Any rational number  $\times$  Mult. inv. = 1  

$$\frac{5}{7} \times \frac{7}{5} = 1$$

⑨ Add. inv. of Zero is itself Zero

⑩ Zero has no multi. inv.

⑪ Multiplicative inverse of 1 is itself 1

⑫ Multiplicative inverse of -1 is itself -1

اللائحة المترافق			
Add. inv.	0	1	-1
Multi. inv.	-	-1	1

اعكس العدد، اقلب

⑬ The number Lies at the Middle of The way (half way) between two numbers

## قانون حام جرا

Number = The Smaller +  $\frac{1}{2}$  | 1<sup>st</sup> - 2<sup>nd</sup> |

Q14 The number lies at one third of the way between two numbers :

Number = The Smaller +  $\frac{1}{3} | 1^{\text{st}} - 2^{\text{nd}} |$

★ find the number that lies at one third of the way between  $\frac{3}{8}$  and  $-\frac{5}{6}$

$$\text{Number} = -\frac{5}{6} + \frac{1}{3} \left| \frac{3}{8} - \frac{-5}{6} \right| = -\frac{31}{72}$$

Find the number that lies at the middle of the way between  $\frac{3}{4}$  and  $\frac{1}{8}$ .

حل يا أخوي ولا مستنى أحللك ببرضه ... ١٩

عشت عارفه الصعيديه ميه  $\frac{1}{8}$  يابا يابا

ابدأ بـ `number =`  $+ \frac{1}{2}$   $- 1 = \dots$   
ابدأ بـ `number =` حلـلـ الصـفـحـة دـاخـلـ الصـفـحـة مـكـتـوبـ الـلـمـ

(4)

## \* Algebraic Term

٥١٢٧٧٣٣٨٤٢  
٠١٢٧٧٣٣٨٤٢

5x  
numerical factor  
Coefficient  
algebraic factor  
Symbolic

## Degree of algebraic term

Sum of indices (powers) of symbolic factors

Ex

$3x^2$  → 2<sup>nd</sup> degree  
 $2x^2y^3$  → 5<sup>th</sup> degree  
 8 → Zero degree

٥١٢٧٧٣٣٨٤٢  
٠١٢٧٧٣٣٨٤٢

## Degree of algebraic expression

is the highest degree of its terms

$5x^2 + 3x - 1$  → 2<sup>nd</sup> degree  
 $4xy - 3x + y$  → 2<sup>nd</sup> degree

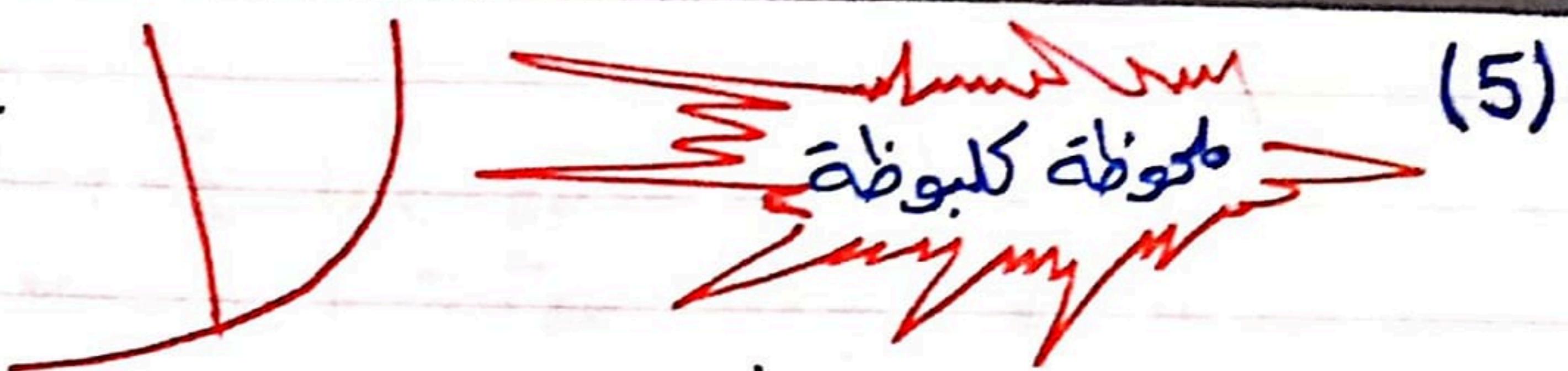
## Like algebraic terms

Like { → Symbols  
 → indices (powers)

$3x^2$  ,  $-5x^2$

$7x^2y$  ,  $9yx^2$

يمكن جمع أو طرح الجذور  
غير المشابهة



$$x^2 + x^3 \neq x^5 \quad \text{ولا} \quad 2x + 3y \neq 5xy$$

يف

أعمال إيه

$$3x + 2x = 5x \quad \text{بس}$$

$$2x^2 + 5x^2 = 7x^2 \quad \text{بس}$$

خذ بالكمان  $\Rightarrow$  لما يقوى

$\begin{matrix} B \\ - A \end{matrix}$  Subtract A From B

نعكس الترتيب ونغير اشارات الالى من

Ex) Subtract  $3x^2 + 5x - 2$  from  $8x^2 - 3x + 5$

الخطوة

$$\begin{array}{r} 8x^2 - 3x + 5 \\ - 3x^2 \ominus 5x \oplus 2 \\ \hline 5x^2 - 8x + 7 \end{array}$$

للتقويم عنوان

بروف حلوات

09127733842

what is The decrease طب و لما يقوى

of A than B

$\begin{matrix} B \\ - A \end{matrix}$  برضه نعكس الترتيب ونغير اشارات الالى من

اقلبه الصيغة علاته او رميه

ex

what is the decrease of

(6)

$$8x - 7y + 3 \text{ than } 3y + x - 9$$

الكل

$$\begin{array}{r} x + 3y - 9 \\ \ominus 8x - 7y + 3 \\ \hline \end{array}$$

$$-7x + 10y - 12$$

what is the increase of

صيغة المجموع

A than B

تحافظ على الترتيب وزن المقادير

ex

what is the increase of

$$3x^2 - 5xy + 7 \text{ than } 2x^2 + 10$$

الكل

$$\begin{array}{r} 3x^2 - 5xy + 7 \\ \ominus 2x^2 \quad \ominus 10 \\ \hline \end{array}$$

$$x^2 - 5xy - 3$$

Prof helwan

واتسون 01127733842

(7)

## \* Multiplying algebraic Terms

$$\textcircled{1} \quad 5x \times (-3y) = -15xy$$

$$\textcircled{2} \quad -3x^2 \times 2x^3 = -6x^5$$

$$\textcircled{3} \quad -2ab^2 \times (-a^2b^3c) = 2a^3b^5c$$

قاعدة إيجاد العنصر

$$(+)(+) = +$$

$$(-)(-) = +$$

$$(+)(-) = -$$

## \* Multiplying monomial by expression

$$\textcircled{1} \quad 3x(4y - x) = 12xy - 3x^2$$

ملاحظة إيه لو الرموز مختلفين يتحطوا جنب بعض  
powers الـ و لو متشابهين يجمع الـ

$$\textcircled{2} \quad 5a^2(3a - 5b - 8) = 15a^3 - 25a^2b - 40a^2$$

## \* Multiplying two binomials

$$\textcircled{1} \quad (x+3)(x+5) = x^2 + \underline{5x} + \underline{3x} + 15 \\ = x^2 + 8x + 15$$

$$\textcircled{2} \quad (x+2)(x-2) = x^2 - 4.$$

$$\textcircled{3} \quad (x+5)^2 = (x+5)(\cancel{x+5}) = x^2 + 5x + 5x + 25 \\ = x^2 + 10x + 25$$

و يمكن تحليل بغير النظر

(8)

## \* Dividing a monomial by monomial

$$\text{ex) } 15x^3 \div 5x = 3x^2$$

# Powers - الـ سلسلة

١٩٦١  
سوان

## expression

②  $(28y^3 - 14y^2 + 7y) \div 7y$

$$= 4y^2 - 2y + 1 \quad \text{الرُّبْع}$$

## \* Dividing algebraic expression by another one

ex Find the quotient of dividing

$$x^2 - 9x + 20 \text{ by } x-4 \text{ (where } x \neq 4)$$

الاول ÷ الاول

- ✖ لطیش فی کله
- ⊖ عنیر لامیا

$$\frac{x-4}{x-5}$$

$$x^2 - 9x + 20$$

بروف  
خلوان

$$\begin{array}{r} -5x + 26 \\ \underline{+ 5x \underline{+ 26}} \end{array}$$

0,0

quotient is  $x-5$

(9)

## \* Factorization by H.C.F

ex Factorize by identify H.C.F :

$$\textcircled{1} \quad 4x^3 - 6x^2 - 8x = 2x(2x^2 - 3x - 4)$$

الخطوة الأولى شوف الاعدادي

4, 6, 8 في table من

نكتب 2

ختار الحرف اللى بيترى بأصغر باور

÷ فتح ( ) ونحل

$$\textcircled{2} \quad 12xy^2 + 18x^2y - 6x^2y^2$$

$$= 3xy(4y + 6x - 2xy)$$

مع نفسك

$$\textcircled{3} \quad 12x^2y + 18x^3y^2 =$$

$$\textcircled{4} \quad 3x^2y - 6xy^2 + 9xy =$$

$$\textcircled{5} \quad 5x^2 + 15xy =$$

## \* Statistics

① Mean =  $\frac{\text{Sum of Values}}{\text{Number of them}}$  متوسط

Ex) find the arithmetic mean of values

2, 5, 7, 5, 4, 9 and 3

Solution

$$\text{Mean} = \frac{2+5+7+5+4+9+3}{7} = \boxed{5}$$

② Median ترتيب ونهاية الأوساط  
odd و

Ex) Find Me : 42, 23, 17, 30, 20

Solution

order : 17, 20, 23, 30, 42

The median is 23

even و

Ex) Find Median : 8, 4, 5, 6

order 4, 5, 6, 8

أولاً نكتب أوساط

$$\text{Median} = \frac{5+6}{2} = \boxed{5.5}$$

③ Mode of : 2, 3, 4, 3, 2, 3 is 3